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SPECTRUM XXI Transition Plan

JSC Project Engineer

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Summary of Changes

System Configuration

The Organizational Server, always an optional capability, will not be delivered at SPECTRUM XXI IOC. Accordingly, reference to it has been removed from this document. Requirements for an organizational server will be defined by the Joint Spectrum Management Working Group.

Fielding Strategy

The fielding strategy has been revised to allow for a quicker fielding to both the CINCs and Services. (See Section 3.1.)

Training Strategy

The training options have been optimized for the diversity of the frequency management community. A modular training approach is planned so that classes can be easily tailored to meet the needs and the students. The Instructor and Key Personnel (IKP) course is no longer planned. However, training and material will still be provided to the Inter-Service Radio Frequency Management School and the Battlefield Spectrum Management Course trainers. (See Section 3.4.)

Hardware Requirements

The need to procure a triple-disk configuration for large client platforms no longer exists. A single large hard disk is preferred. Either IDE or SCSI controllers can be used. (See Section 4.2.)

Software Requirements

The requirement to procure a single user license for Oracle for each client platform no longer exists. The database used on the client platform does not require a license. (See Section 4.2.)

Map Databases

SPECTRUM XXI will automatically map frequency assignment data from JSMS_w. (See Section 5.6.2)

Fielding Schedule

The fielding schedule has been revised to account for the delay in SPECTRUM XXI Initial-Operating-Capability (IOC) deployment. (See Section 8.)

Table of Contents

1 INTRODUCTION	1
1.1 Background.....	1
1.2 Objective.....	1
1.3 Intended Audience.....	1
1.4 Report Contents.....	2
2 SPECTRUM XXI OVERVIEW	3
2.1 System Configuration	3
2.1.1 Current Spectrum Management System Configuration.....	3
2.1.2 SPECTRUM XXI System Configuration.....	4
2.2 SPECTRUM XXI Site Types.....	4
2.2.1 Central Server Site	5
2.2.2 Regional Server Sites	5
2.2.3 Client Sites.....	6
2.3 Wide-Area Network Configurations	7
2.4 Legacy Systems Interoperability	7
3 TRANSITION STRATEGY	8
3.1 Strategy Overview	8
3.2 CINC Fielding.....	8
3.3 Service Fielding.....	9
3.4 Training Strategy	9
3.4.1 SPECTRUM XXI Training Modules	9
4 SITE REQUIREMENTS	12
4.1 Site Configuration Considerations	12
4.1.1 LAN Server Considerations.....	12
4.1.2 WAN Considerations	12
4.1.3 Client Configuration Considerations.....	13
4.2 Hardware/COTS Software Requirements.....	14
4.3 Security Requirements.....	15
4.3.1 Security Standards and Regulations.....	15
4.4 Physical Site Requirements.....	16
4.5 Communication Requirements.....	16
5 TRANSITION STEPS	18
5.1 Plan Site Transition	18
5.1.1 Determine Site Configuration	18
5.1.2 Determine Site Support Requirements	18
5.1.3 Develop Site Transition Plan	19
5.2 Acquire Hardware/Software/Network Access	21
5.2.1 Acquire Hardware/COTS Software	21
5.2.2 Secure Area.....	21
5.2.3 Coordinate SIPRNET Requirements with Base Network Manager.....	22
5.2.4 Schedule SPECTRUM XXI Training	22
5.3 Obtain 3rd Party Training	22
5.4 Implement Client Site.....	23
5.4.1 Install Hardware/COTS Software	23
5.4.2 Determine Site Readiness.....	23
5.5 Obtain SPECTRUM XXI Training	23
5.6 Install SPECTRUM XXI	23
5.6.1 Install SPECTRUM XXI software.....	23

5.6.2 Map Databases	24
5.6.3 Establish Client Account and Data Profiles.....	25
5.6.4 Install Background Assignment Data.....	25
5.7 Operate SPECTRUM XXI.....	25
5.8 Decommission Legacy Equipment.....	25
6 STAFFING REQUIREMENTS	26
6.1 Regional Server Sites.....	26
6.2 Client Sites with LAN Servers	26
6.3 Client Sites	26
7 RESPONSIBILITIES	27
7.1 JSC	27
7.2 Regional Server Site Organizations.....	27
7.3 Client Site Organizations Implementing a LAN Server	27
7.4 Client Site Organizations	28
8 TIME LINES.....	29
8.1 Overview.....	29
8.2 Planning and Acquisition Time Lines	29
8.3 CINC Fielding Schedule.....	29
8.3.1 ACOM/CENTCOM Support.....	30
8.3.2 EUCOM Support	31
8.3.3 PACOM Support.....	31
8.3.4 Other CONUS CINCs Support.....	32
8.4 Service Fielding Schedule.....	33
8.5 Regional Training	34
8.6 DCF Decommissioning	34
9 RISK ASSESSMENT AND CONTINGENCY PLANS	35
9.1 Software Development	35
9.2 Hardware Acquisition.....	35
9.3 Wide-Area Networking	35
10 GLOSSARY	36

List of Figures

Figure 2-1. Current Spectrum Management System Configuration	3
Figure 2-2. SPECTRUM XXI System Configuration.	5
Figure 2-3. Client Site Configurations	6
Figure 3-1. SPECTRUM XXI Transition Strategy.....	8
Figure 4-1. WAN Connection Types.....	16
Figure 8-1. SPECTRUM XXI Fielding Schedule Overview.	29
Figure 8-2. Planning and Acquisition Schedule.	29
Figure 8-3. CINC Fielding Schedule.....	30
Figure 8-4 ACOM/CENTCOM Fielding Schedule.....	30
Figure 8-5. EUCOM Fielding Schedule.	31
Figure 8-6. PACOM Fielding Schedule.	32
Figure 8-7. Other CONUS CINCs Fielding Schedule.	32
Figure 8-8. Joint Service Fielding Schedule.	33

List of Tables

Table 2-1. WAN Configurations and Options.	7
Table 3-1. SPECTRUM XXI Training Modules.....	10
Table 4-1. Recommended Disk Size Based on the # of Frequency Records.....	13
Table 4-2. SPECTRUM XXI Platform Configurations.	14
Table 4-3. SPECTRUM XXI COTS Software.....	15
Table 5-1. JSMS _w User File Preservation.....	24
Table 5-2. DCF User File Preservation.....	24

1 INTRODUCTION

In accordance with a Program Budget Decision, the Joint Spectrum Center (JSC) was tasked to develop a standard, Department of Defense (DoD)-wide, spectrum management information system. Concurrently, the Joint Staff appointed the Commander of the JSC to be chairman of the Joint Spectrum Management Working Group (JSM WG). The JSM WG provides a forum within the DoD spectrum management community for soliciting input for automation requirements and for determining the migration strategy for spectrum management automation.

Specifically, the JSM WG was tasked to "... address the inclusion of spectrum management applications into the Global Command and Control System (GCCS)" by

- articulating joint spectrum management requirements,
- nominating existing applications that meet those requirements, and
- identifying the need for further software development to satisfy those requirements.

1.1 Background

The Commander-in-Chiefs (CINCs) and Service users of spectrum management automation systems have completed a requirements prioritization survey. The survey included over 500 spectrum management automation requirements from existing spectrum management systems, functional area policy and procedure documents, and the improvement opportunities identified during Corporate Information Management (CIM) Modeling of DOD Management and Use of the Electromagnetic Spectrum (MUES) workshops conducted during FY92 through FY 95 by the J208Z Permanent Working Group. All requirements identified through this survey comprise the total requirements of SPECTRUM XXI.

The Joint Staff J-6 directed that the JSC develop SPECTRUM XXI as a Windows-NT-based application to address the spectrum management requirements of the CINCs, the Joint Task Force (JTF) commanders, the Services, and the sustaining base elements. To meet this direction, a subset of the total requirements defining an initial operating capability (IOC) was formulated based on the JSM WG survey results. The SPECTRUM XXI IOC will replace the Joint Spectrum Management System for Windows (JSMS_w) and the Frequency Resource Record System (FRRS) Distributed Computing Facilities (DCF_s).

Subsequent software releases, to be defined and coordinated via the JSM WG, will address the remaining CINC and Service functionality identified through the survey, but not implemented as part of the IOC, as well as selected MUES improvement opportunities.

1.2 Objective

This document was written to initiate SPECTRUM XXI transition planning and to provide field integration guidance. Each SPECTRUM XXI site should prepare a site transition plan in response to this document.

1.3 Intended Audience

This document was written for all planners and users of the SPECTRUM XXI system. It provides a complete overview of the transition strategy and identifies the actions required to migrate from DCF and Joint Spectrum Management System for Windows (JSMS_w) operations to SPECTRUM XXI.

1.4 Report Contents

Section 2 presents an overview of the SPECTRUM XXI system including the system configuration, SPECTRUM XXI site types, wide-area networking configurations, and legacy systems interoperability.

Section 3 presents an overview of the transition strategy including both fielding and training strategies.

Section 4 states the site requirements in terms of hardware/commercial-off-the-shelf (COTS) software requirements, security requirements, physical site requirements, and communication requirements.

Section 5 provides details about the transition process from a Client site viewpoint.

Section 6 identifies the SPECTRUM XXI staffing requirements for Regional Server and Client sites.

Section 7 identifies the responsibilities for each organization planning to use SPECTRUM XXI.

Section 8 provides nominal time lines for the transition to SPECTRUM XXI operations.

Section 9 identifies potential risk areas associated with the transition to SPECTRUM XXI operations and the steps to be taken to mitigate potential risks.

Section 10 provides a list of acronyms used in this document.

2 SPECTRUM XXI OVERVIEW

2.1 System Configuration

The development of SPECTRUM XXI is the first step in providing a single information system that addresses DoD spectrum management automation requirements. SPECTRUM XXI migrates two joint spectrum management applications into a single DoD system and provides a target environment for future CINC and Service spectrum management system migration.

2.1.1 Current Spectrum Management System Configuration

Figure 2-1 illustrates the current spectrum management system configuration involving the JSC Central Repository, the DCF sites, and the JSMS_W sites.

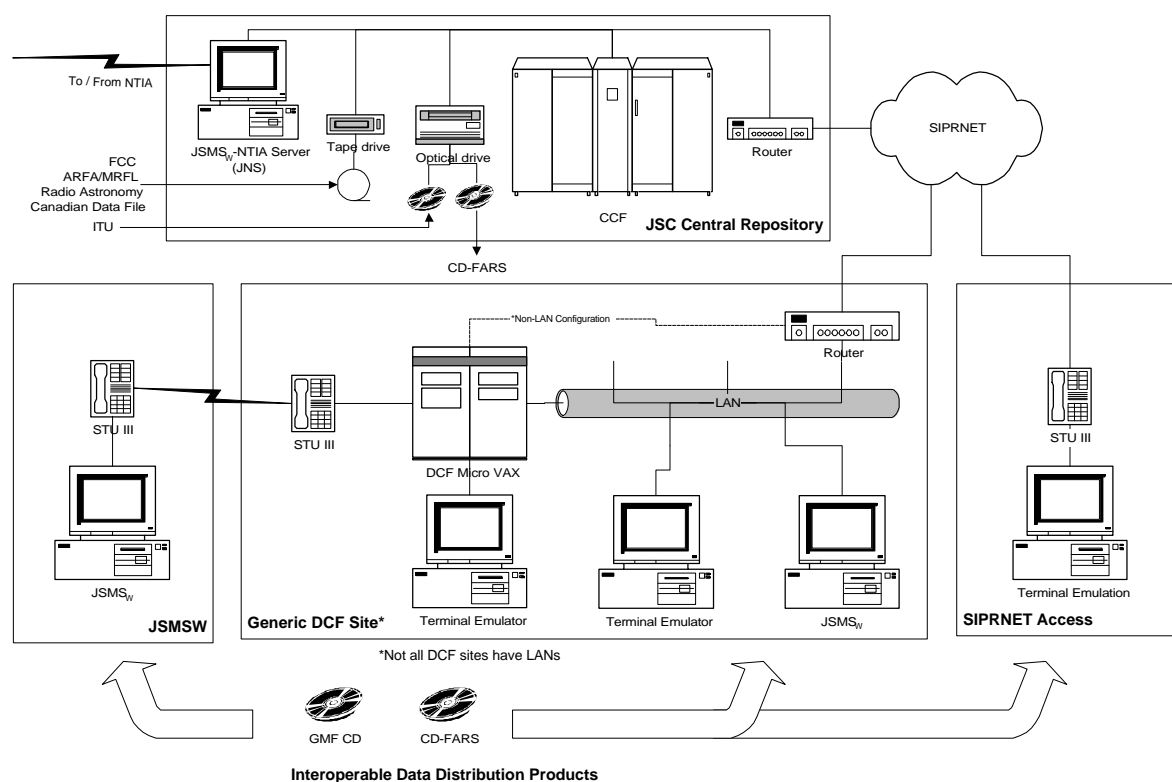


Figure 2-1. Current Spectrum Management System Configuration.

2.1.1.1 JSC Central Repository

The JSC Central Repository provides DoD spectrum management with a central database that includes the FRRS, the Background Environment Information (BEI) file, the Spectrum Certification (SC) database, and the Tactical Systems (TACSYS) database. The JSC Central Repository also serves the JSC internal Electromagnetic Compatibility/Vulnerability (EMC/V) and Electromagnetic Environment Effects

(E3) analyst community.

The JSC Central Repository provides the mechanism to transfer data to and from the National Telecommunications and Information Administration (NTIA) as part of the permanent frequency assignment process for the DoD in the United States.

2.1.1.2 DCF Sites

The DCF sites provide a number of functions, which include: providing the spectrum management infrastructure such as proposal status tracking and frequency assignment data distribution of assignment updates and remote access FRRS retrievals; supporting e-mail services; providing proposal processing by retrieval, editing, and validation of the frequency proposal; and by providing management reports. The DCF sites support multiple spectrum management elements involved with joint and sustaining-base operations.

2.1.1.3 JSMS_W

JSMS_W support spectrum management activities during both tactical and sustaining-base operations. During tactical operations, JSMS_W supports establishment and maintenance of the frequency use database and identifies candidate frequencies, supports the development of the Joint Restricted Frequency List (JRFL), supports the engineering of compatible frequency use including EW, generates and maintains allotment plans, helps coordinate new systems in theater, and provides interference analysis tools.

At the sustaining-base, JSMS_W supports acquisition of permanent frequency assignments, manages temporary frequency assignments and schedules, helps resolve interference, and supports the materiel acquisition process through spectrum certification.

2.1.1.4 Current Infrastructure

The Central Computing Facility (CCF) and DCF sites are permanently connected via the Secret Internet Protocol Router Network (SIPRNET). JSMS_W sites can be permanently connected to the system via SIPRNET or temporarily as needed through the use of secure telephone units (STU III). Data flows into the system from JSMS_W users through the DCFs to the CCF of the Central Repository. Database updates flow from the CCF to the DCFs. JSMS_W users can update their JSMS_W databases by connecting to the SIPRNET or dialing into a DCF.

2.1.2 SPECTRUM XXI System Configuration

Figure 2-2 illustrates the SPECTRUM XXI objective system configuration. The new components added by SPECTRUM XXI include a Central Server, Regional Servers, and Client platforms. The CCF will continue to support the JSC's EMC/V and E3 missions and will continue to interface with NTIA for frequency proposal and assignment processing. See the SPECTRUM XXI Functional Requirements for the phased implementation of the capabilities.

2.2 SPECTRUM XXI Site Types

SPECTRUM XXI is based on three site configurations that support a worldwide deployment of a single DoD spectrum management system: the Central Server site, the Regional Server sites, and Client sites.

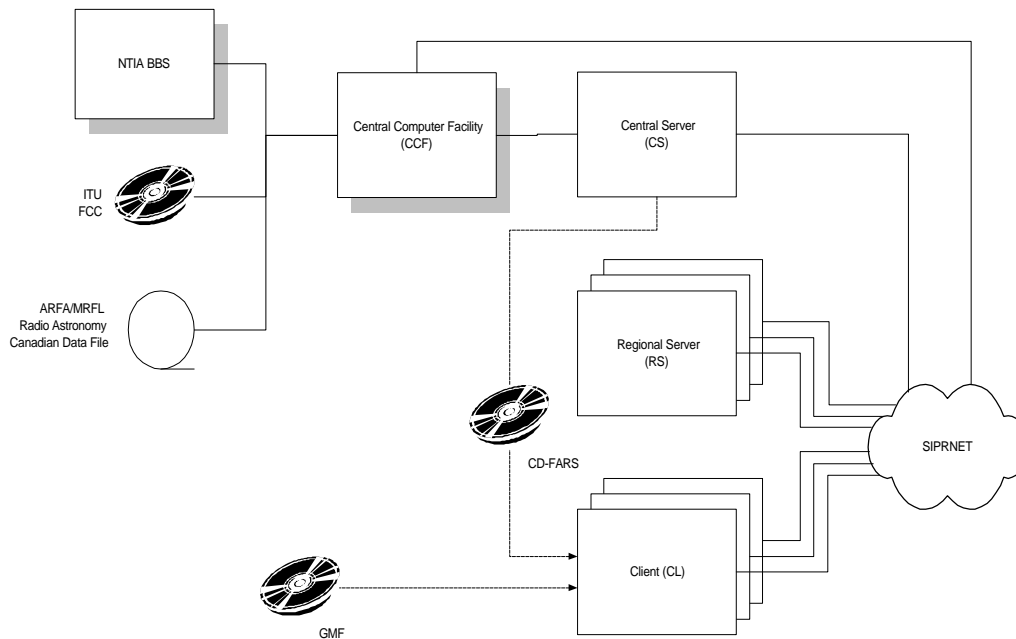


Figure 2-2. SPECTRUM XXI System Configuration.

2.2.1 Central Server Site

The Central Server, located at the JSC, will be the main repository of frequency assignment data for DoD. It will exchange frequency assignment proposals addressed to the National Telecommunications and Information Administration (NTIA) with the existing Central Computer Facility. The Central Server will receive update status on frequency assignment actions from the NTIA involving both DoD assignments within the United States and possessions (US&P) and other federal agencies. This repository will include permanent frequency assignments from data sources such as the Frequency Resource Record System (FRRS) and NTIA's Government Master File (GMF). The Central Server will automatically exchange data with the Regional Servers, via SIPRNET, as updates are posted on either platform.

2.2.2 Regional Server Sites

The Regional Servers will provide frequency proposal processing and updates to all spectrum management users within a geographic region. This data will include the frequency proposal and frequency proposal status, FRRS frequency assignments, and GMF background frequency assignments. The Regional Servers are mirror sites of each other and the Central Server so that SPECTRUM XXI clients can use the server that is most accessible from their location.

2.2.2.1 Regional Server Locations

Three Regional Server sites have been identified based on their central location and resource availability, such as existing SIPRNET access and local area network (LAN) capabilities. They are as follows:

CONUS: JSC, Annapolis, MD
 Europe: JFMOEUR
 Pacific: JFMOPAC

The selection of the CONUS Regional Server site necessarily included consideration of the cost to install and maintain the system, the anticipated time to respond to an unplanned maintenance requirement, and the data throughput expected between the CONUS Regional Server and the Central Server sites.

2.2.3 Client Sites

Client sites are grouped into three basic categories: Client sites supported by a local area network (LAN), Client sites without a LAN, and Remote Dial-up Client sites. These Client site configurations are shown in Figure 2-3. Client sites operating on a LAN are configured for offices with multiple staff that wish to use existing LAN capabilities in their office.

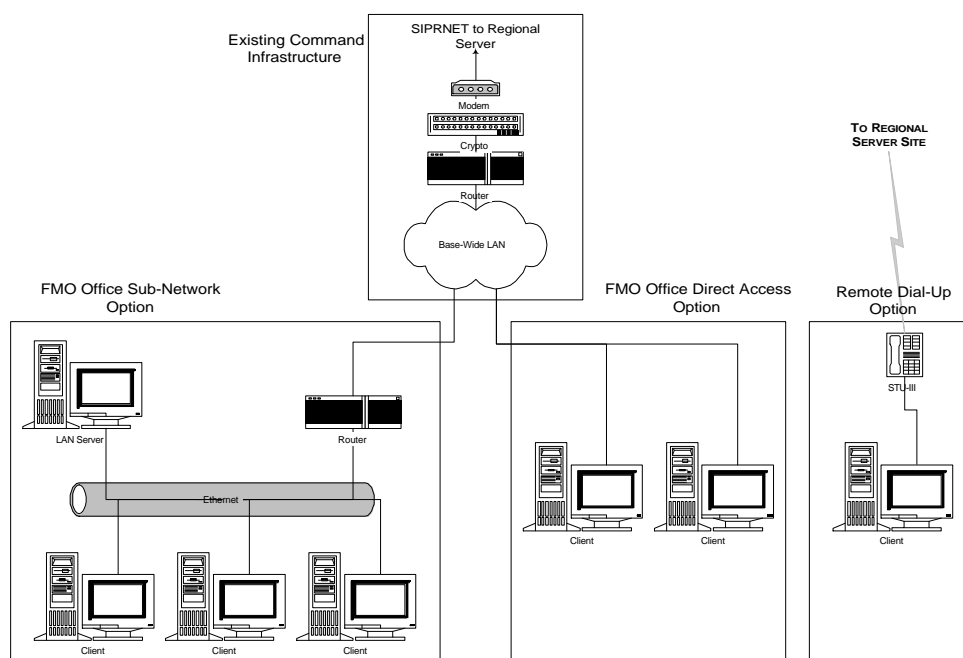


Figure 2-3. Client Site Configurations.

Each Client platform will have a local database that supports the various spectrum management activities of that site, such as a CINC site, a Service site, a JTF/Component site, an Area Frequency Coordinator (AFC) site, or a Base, Post, Camp, and Station (BPCS) site. These platforms can be located anywhere. They will have the capability to access spectrum management data from any Regional Server in order to acquire updates of FRRS and GMF transactions and to coordinate frequency proposals between JTF/Component sites. Client platforms and the Regional Servers will update each other's frequency record databases using the SPECTRUM XXI data exchange mechanism and received updates on frequency transactions occurring in their area of interest.

Spectrum management users will be able to exchange frequency record data (automatically or on demand) between the Regional Servers or other Client platforms via SIPRNET or a secure telephone unit (e.g., STU-III).

2.3 Wide-Area Network Configurations

SPECTRUM XXI supports a number of networking configuration options, which include: SIPRNET operations, Remote Dial-Up operations, and Stand-Alone operations. The networking capabilities supported by each Wide-Area Network (WAN) option are shown in Table 2-1.

Table 2-1. WAN Configurations and Options.

WAN Access Type	SPECTRUM XXI Supported Capabilities				
	Cross-Connect to Regional Servers	Clients Can Be Relocated	SPECTRUM XXI Formatted File Transfers	SFAF Formatted File Transfers	CD-ROM Background Assignments
SIPRNET	Yes	Yes	Yes ¹	Yes ²	Yes
Remote Dial-Up	Yes	Yes	Yes ¹	Yes ²	Yes
None (Stand-Alone)	Not Applicable	Yes	Yes ³	Yes ²	Yes

¹ Records transferred by Data Exchange maintain full status tracking log information and edit authority.

² SFAF formatted records will not contain status tracking log information.

³ Records transferred by spawning will contain status tracking log information by not edit authority.

2.4 Legacy Systems Interoperability

SPECTRUM XXI supports data exchanges with a number of information systems including both spectrum management and communication planning systems.

SPECTRUM XXI will exchange American National Standard Code for Information Interchange (ASCII) data in Standard Frequency Action Format (SFAF) format with JSMS_w and other spectrum management systems supporting the current SFAF data exchange format. Similarly, SPECTRUM XXI will exchange ASCII SFAF formatted data with Mobile Subscriber Equipment-Network Planning Terminal (MSE-NPT) and other communications planning systems supporting the current SFAF data exchange format. SPECTRUM XXI will also import Revised Battlefield Electronic CEOI System (RBECS) formatted data.

3 TRANSITION STRATEGY

The SPECTRUM XXI transition strategy provides a non-disruptive crossover from DCF and JSMS_w operations to SPECTRUM XXI. Concurrent operations are planned to allow for each Frequency Management Office (FMO) to conduct parallel operations until each FMO is confident enough to complete the crossover.

3.1 Strategy Overview

A multiple phase transition has been planned for SPECTRUM XXI as shown in Figure 3-1. Fielding will occur simultaneously for the Services and CINCs. The phases include:

- an initial fielding to the Service Headquarters, ACOM, and EUCOM supported by the Central Server, and the CONUS and EUCOM Regional Servers,
- a second round of dedicated training to the Services and PACOM supported by the PACOM Regional Server,
- a third round of dedicated training to the Services and the other CONUS based CINCs (SOUTH, CENT, SOC, Space),
- finally, open SPECTRUM XXI training available from the JSC, the Army's Signal Center, and the Inter-Service Radio Frequency Management School (IRFMS).

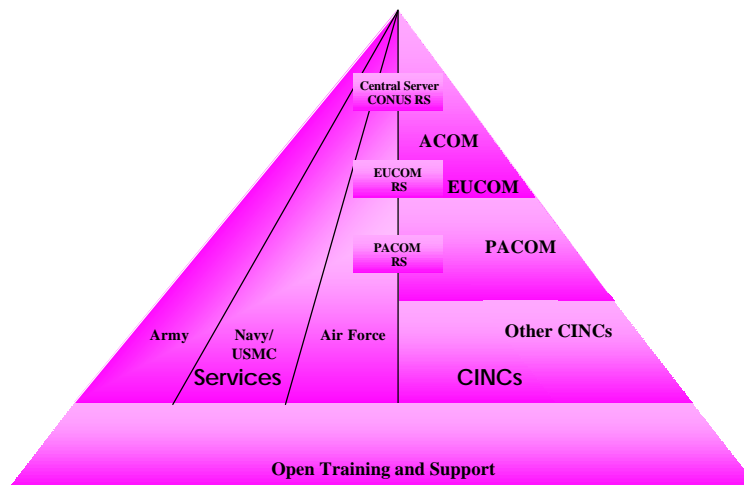


Figure 3-1. SPECTRUM XXI Transition Strategy.

3.2 CINC Fielding

The objective of CINC fielding is to provide full SPECTRUM XXI capability to the CINCs as soon as possible. At the commencement of the first phase the Central Server will be operational, the CONUS Regional Server will be implemented, and training will be conducted for ACOM, CENTCOM, and their associated clients. Thus, an end-to-end capability will be established so SPECTRUM XXI operations can begin.

Towards the end of this phase the EUCOM Regional Server will become operational and training will be conducted in the EUCOM theater.

During the second phase of the CINC fielding, the PACOM Regional Server will become operational and training will be conducted in the PACOM theater. During the third phase dedicated training will be provided by the JSC for the other CONUS based CINC frequency managers. No other dedicated training will be provided during this phase, however, open training (first come, first served) will be available at the JSC.

The fourth phase of the CINC fielding will include general software and system support as well as open training conducted from the JSC, the Army's Signal Center, and the IRFMS.

A mechanism for obtaining user support and for reporting system and software problems will be in place during all CINC fielding phases. If required, software upgrades and patches will be posted on the SPECTRUM XXI web page for community-wide access.

3.3 Service Fielding

The objective of Service fielding is to provide full SPECTRUM XXI capability to the Services as soon as possible. At the commencement of the first phase, the Central Server will be operational, the CONUS Regional Server will be implemented, and training will be conducted at the JSC for Army, Navy, and Air Force clients. It is recommended that this training include headquarters, command, and field clients so that an end-to-end capability will be established and SPECTRUM XXI operations can begin.

During the second and third phases of the Service fielding, training will be conducted from the JSC for Army, Navy, and Air Force clients.

The fourth phase of the Service fielding will include general software and system support as well as open training conducted from the JSC, the Army's Signal Center, and the IRFMS.

A mechanism for obtaining user support and for reporting system and software problems will be in place during all Service fielding phases. If required, software upgrades and patches will be posted on the SPECTRUM XXI web page for community-wide access.

SPECTRUM XXI will support interoperability with JSMS_w by the exchange of ASCII SFAF formatted frequency proposals and assignments. This capability allows the field FMOs to transition to SPECTRUM XXI as their resources allow.

3.4 Training Strategy

SPECTRUM XXI training will address the broad audience of users ranging from a school-trained, field-experienced Spectrum Manager to a part-time, non-trained, non-experienced, Post/Camp/Station/Base frequency manager.

3.4.1 SPECTRUM XXI Training Modules

To address the needs of the spectrum management community, a modular training package is planned. This package will allow the tailoring of the course to the specific needs of the attendees. For example, the course may be tailored as an update for experienced JSMS_w users, or tailored for participants that only

need the proposal processing functions, or the whole course such for CINC and JTF elements.

The SPECTRUM XXI training modules are shown in Table 3-1.

Table 3-1. SPECTRUM XXI Training Modules.

BLOCK 1 (ALL STUDENTS)	36 Hrs 30 min
1. Introduction	15 min
2. Spectrum XXI Development Background	45 min
3. "Managing the Spectrum Using Spectrum XXI" Briefing	1 Hr
4. Getting Started	4 Hrs
5. Loading Equipment Data	30 min
6. Managing SCS Data	1 hr
7. Managing Topographic Data Using the Topographic Manager (TOPOMAN)	30 min
8. Managing Frequency Assignments	19 Hrs 30 min
A. Purpose of Frequency Assignment	10 min
B. Importing Initial Frequency Records into Spectrum XXI	2 Hrs 20 min
C. Creating and Restoring Database Archives	30 min
D. Querying Spectrum XXI for Frequency Records	1 Hr 30 min
E. Outputting Frequency Records from Query Results	1 Hr
F. Changing Status of Selected Frequency Records	1 Hr 30 min
G. Creating a Site License from Selected Frequency Records	10 min
H. Plotting Selected Frequency Records	50 min
I. Spawning Selected Frequency Records to a File	30 min
J. Deleting Selected Frequency Records	5 min
K. Mass-Changing Selected Frequency Records	45 min
L. Copying a Selected Frequency Records to the Editor	10 min
M. Editing a New Frequency Proposals in the Editor	4 Hrs
N. Nominating Frequencies from the Editor	1 Hr 30 min
O. Displaying Results of Last Import	5 min
P. Packing Databases	5 min
Q. Performing Data Exchange and Electronic Coordination	50 min
R. Creating Frequency Records Management Reports	2 Hrs
S. Practical Exercises	1 Hr 30 min
9. Running Standalone Compliance	1 Hr
10. Using Spectrum XXI System Manager	1 Hr
11. Block 1 Practical Exercises	7 Hrs
BLOCK 2 (MORE FUNCTIONS)	10 Hrs
12. Managing Allotment Plans	3 Hrs
13. Performing Interference Analysis	1 Hr
14. Managing Interference Reports	30 min
15. Using Spectrum XXI Engineering Tools	3 Hrs
16. Block 2 Practical Exercises	2 Hrs 30 min
BLOCK 3 (TACTICAL STUDENTS)	9 Hrs
17. Managing Joint Restricted Frequency Lists (JRFLs)	2 Hrs
18. Performing Electronic Warfare Deconfliction	30 min
19. Block 3 Practical Exercises	6 Hrs 30 min

The modules are divided into 3 training blocks:

- Block 1: Basic System and Proposal Processing Capabilities
- Block 2: Engineering Capabilities
- Block 3: Joint Operations Capabilities

Block 1 training is recommended for all types of SPECTRUM XXI clients. The 36-hour training block was specifically designed for frequency managers whose primary focus is proposal processing.

Block 2 training is recommended for those frequency managers that need to use the engineering capabilities of SPECTRUM XXI. The training modules of Block 1 training are the recommended prerequisites for this 10-hour course addressing interference analysis and the other engineering tools in SPECTRUM XXI.

Block 3 training is recommended for all frequency managers that participate in joint operations. The 9-hour course will focus on SPECTRUM XXI capabilities such as the Joint Restricted Frequency List (JRFL), EW Deconfliction, and the Allotment Plan Generator. The training modules of Block 1 and 2 are the recommended prerequisites for this block of training.

All SPECTRUM XXI training modules will focus on frequency management techniques, use of SPECTRUM XXI modules, and how to use SPECTRUM XXI in real-world situations. The student's confidence in the operation of SPECTRUM XXI is established by performing practical exercises utilizing advance spectrum management procedures. The course will be conducted once or twice a month at the JSC.

SPECTRUM XXI training will be available from IRFMS and the US Army Battlefield Spectrum Management Course (BSMC) upon completion of SPECTRUM XXI transition. IRFMS and BSMC will become the primary trainers for new SPECTRUM XXI users.

3.4.2 System Administration Training

Certain SPECTRUM XXI Client site configurations will require site custodians who are knowledgeable in establishing, maintaining, and troubleshooting NT networks, hardware, and LAN communications. Third party-provided hardware and NT network training recommended for sites electing to use an LAN server will include:

- INTEL-based platforms setup, operations, maintenance, and diagnostics
- Windows NT setup, operations, maintenance, and diagnostics
- Windows NT-based LAN setup, operations, maintenance, and diagnostics

Minimal basic Windows NT system administration training will be provided to the user in the New System Training as part of the Getting Started module. This training is not sufficient for personnel assigned to system administration duties and should be augmented with the recommended training listed in the previous paragraph.

4 SITE REQUIREMENTS

4.1 Site Configuration Considerations

The first step in converting to SPECTRUM XXI operations is to determine the appropriate site configuration required. Some options the user may have to consider are whether a LAN server is desired or necessary, what type of WAN connection will be used, and the configuration of the Client platform.

4.1.1 LAN Server Considerations

SPECTRUM XXI does not require, but will support LAN based operations at a Client site. The advantage of using a LAN server will depend on the requirements of the Client site.

The following questions aid in deciding if a LAN server is desired at a Client site:

- Does the Client site have multiple spectrum managers? Will this staff depend on SIPRNET or STU-III remote dial-up for their WAN connection?
- Is there an existing FMO LAN? Is the LAN currently supported by a LAN server?
- Does the office staff use or plan to use shared devices (printers, scanners, backup devices, etc.) or shared files between users?
- Does the office staff use or plan to use a local e-mail post office?
- Does the Client site have access to, or maintain staff expertise in, LAN technology?

4.1.2 WAN Considerations

SPECTRUM XXI is designed to use a WAN to transfer files. Although each Client will have a complete database and a set of processing capabilities, whether or not SPECTRUM XXI can efficiently transfer files and maintain current data for all users will depend on the WAN. Two types of WAN connections will be supported: direct SIPRNET connections and STU-III remote access to the Regional Server (STU-III to STU-III or STU-III access of the SIPRNET).

A direct SIPRNET connection should be seriously considered if the FMO is responsible for more than 2000 permanent frequency assignments or if the FMO oversees more than 5000 temporary assignments. In deciding if a direct SIPRNET connection is required, the following questions should be examined:

- Does the Client site currently have SIPRNET access? Is this access maintained by the base hosting the spectrum management office? Does the spectrum management office staff maintain its own SIPRNET connection account (such as an Independent Field Office)? Is the FMO in a commercial facility?
- If the Client site currently does not have SIPRNET access, does its sustaining base have or plan to provide SIPRNET access?

As a general recommendation, a STU-III remote dial-up connection can adequately support an FMO who is responsible for less than 2000 permanent frequency assignments or who oversees less than 5000 temporary assignments. Additionally, a STU-III remote dial-up capability should be considered if the Client site is subject to intermittent SIPRNET service. Whether or not the Client site accesses the Regional Server's STU-IIIs or uses the STU-III to access the SIPRNET connection to the Regional Server

will depend on the site's particular situation.

SPECTRUM XXI Client platforms will support the later upgrade from STU-III to SIPRNET WAN connections.

4.1.3 Client Configuration Considerations

SPECTRUM XXI takes into account the background assignments within the FMO's area of responsibility (AOR) as well as the terrain elevation and feature data for the region. This makes the disk drive requirements dependent on the size of the FMO's AOR.

Table 4-1 provides general guidance on the required size of the Client platform hard disk relative the anticipated number of frequency records stored on the platform.

A small disk Client configuration is intended for the base or installation frequency manager and the frequency action officer assigned to a large FMO. The small disk Client configuration (2.1 Gbyte drive) will support a base or installation frequency manager having an AOR with a radius of 200 miles or less and requiring storage of approximately 200,000 frequency records. If a base or installation frequency manager is responsible for a larger AOR, then a larger disk drive, 3.2 Gbytes, 6.4 Gbytes, or larger, should be procured based on the information in Table 4-1.

Table 4-1. Recommended Disk Size Based on the # of Frequency Records.

# Frequency Records	Storage Space Required (Gbytes)	Recommended Minimum Disk Size (Gbytes)
10,000	0.04	2.1*
20,000	0.07	2.1*
30,000	0.11	2.1*
50,000	0.18	2.1*
100,000	0.36	2.1*
200,000	0.73	2.1
300,000	1.09	3.2*
500,000	1.82	6.4**
1,000,000	3.63	7.5**
2,000,000	7.27	13.5**
3,000,000	10.90	16.8**

* For smaller disks SPECTRUM XXI should not occupy more than half the disk.

**Windows NT restricts the boot disk partition to 4 Gbytes. Configure the other disk partition as a single large drive.

In the case of a frequency action officer assigned to a large FMO, a similar criterion may be applied. Large FMOs tend to partition their activities either by frequency bands or by geographical areas. A small disk Client configuration (2.1 to 3.2 Gbytes) will support about 200,000 background assignments in addition to up to 10,000 permanent proposals and assignments. If this criterion appears constraining, then a larger disk drive, 6.4 to 7.5 Gbytes, should be procured.

The hard disk drives should be removable to support the security requirements of SPECTRUM XXI.

The advantage of small computer system interface (SCSI) disk drives have been overcome by the development of Ultra ATA drives. The Ultra ATA drives offer a cost effective alternative to the more expensive SCSI drives while maintaining almost similar performance characteristics.

4.2 Hardware/COTS Software Requirements

The SPECTRUM XXI hardware requirements depend on the type of site being fielded, as discussed in the previous section. Table 4-2 identifies the minimum platform requirements for each fielded site. Shown in Table 4-2 are the Regional Server and Client platform configurations.

Depending on the type of SIPRNET connectivity option selected, the Client site will have to obtain either STU-III commercially or SIPRNET direct connection equipment from Defense Information Systems Agency (DISA).

The recommended COTS software to support SPECTRUM XXI operations is shown in Table 4-3. The Office Automation and GCCS options are not required by SPECTRUM XXI but are typical software requirements, depending on the mission of the Client site.

Table 4-2. SPECTRUM XXI Platform Configurations.

	Regional Server	Client Configuration
CPU	Dual Pentium II	Pentium II
RAM	128 Mbytes	64 Mbytes
Disk Drives Cache Memory Controller	12 - 4 Gbytes TBD SCSI (Adaptec 2940)	See Table 4-1 ¹ 512 k Bytes Ultra ATA
Monitor Graphics Accelerator Video Memory	21" 1280x1024 pixels Yes 2 Mbytes	17" 1280x1024 pixels ² Yes 2 Mbytes
CD-ROM	12x or faster	12x or faster
PCMCIA Type II Card Slots ³	2 each	2 each
Printer	600x600 dpi NT supported	600x600 dpi NT supported
Tape Backup	4 mm, SCSI	4 mm
Floppy Disk	3.5"	3.5"
Mouse, Keyboard	Yes	Yes
UPS	Yes	650 VA ⁴
Operating System	NT 4.0 (Server)	NT 4.0 (Workstation)

¹ Hard disk drives should be removable.

² SPECTRUM XXI may also be hosted on a Laptop computer supporting a 1024x768-pixel display.

³ PCMCIA Type II card slots are for use with Fortezza cards.

⁴ American Power Conversion (APC) model Back-ups Pro 650 VA or equivalent.

Table 4-3. SPECTRUM XXI COTS Software

	Regional Server	Client
Database	Oracle* 8 Server for NT	DBMS included with SPECTRUM XXI software
e-mail	Not Applicable	UFS ¹
Web Browser	Not Applicable	UFS (Netscape ²)
Telecommunications	TBD	UFS
Tape Backup	TBD	UFS ³
Office Automation	Not Applicable	UFS (MS Office ²)
Virus Protection	TBD	UFS
GCCS	Not Applicable	UFS ⁴

UFS - User Furnished Software

* The number of licenses purchased establishes the maximum number of simultaneous users.

¹ Defense Messaging System (DMS) compliant, such as MS Exchange

² Defense Information Infrastructure (DII) Compliant NT software

³ NT Compliant 4mm tape backup software

⁴ GCCS NT Segments determined by user requirements and acquired from DISA

4.3 Security Requirements

The Client site security requirements will depend on the type of WAN option selected and whether or not the Client site processes classified spectrum management data. The most stringent set of security requirements is for those sites opting for permanent SIPRNET connections. The SPECTRUM XXI client user is responsible to meet all applicable security requirements associated with the operation of SPECTRUM XXI.

4.3.1 Security Standards and Regulations

DoD security regulations are established in the DoD 5200.1R¹ Information Security Program Regulation. Each Service has issued an extension to DoD guidance, under the following service documents: AR 380-19², AFI 31-401³, AFSSI 5102⁴, SECNAVINST 5239.3⁵. Typically local commands will further supplement Service guidelines with locally relevant regulations. Each Client site opting for either a direct SIPRNET or a STU-III WAN connection to SPECTRUM XXI should contact their base security officer as soon as the WAN option has been chosen.

Both the accreditation of a classified data processing site and the reaccreditation of an existing classified data processing site are lengthy and time-consuming processes. Even existing accreditation will have to be updated prior to the commencement of SPECTRUM XXI operations. Each SPECTRUM XXI site is responsible for accomplishing these processes.

¹ DoD 5200.1-R "Information Security Program," January 1997.

² AR 380-19 "Information Systems Security," 1 August 1990.

³ AFI 31-401/AFMC Supplement 1(CC) "Managing the Information Security Program," 20 November 1996.

⁴ AFSSI 5102 "The Computer Security (COMPUSEC) Program," 23 September 1996.

⁵ SECNAVINST 5239.3 "Department of the Navy Information Systems Security (INFOSEC) Program," 14 July 1995.

To aid in the understanding of the site accreditation process, a typical sequence of events is presented below. These steps may vary depending on local regulations.

- Requirements are identified by the Client site custodian in coordination with the base security officer.
- The facility is modified to comply with security requirements.
- An accreditation request is forwarded to the Designated Accreditation Authority (DAA).
- Accreditation is received from the DAA and forwarded to DISA.
- DISA is contacted and the SIPRNET connection is requested.
- The SIPRNET connection is installed.

Approval to connect to the SIPRNET is received from DISA.

4.4 Physical Site Requirements

SPECTRUM XXI is designed to use commercial hardware products not requiring special physical considerations. Commercial products conform to typical operating ranges for ambient temperature, humidity, and altitude. Specific operating range characteristics of a system should first be verified during hardware acquisition as being adequate for its intended use.

4.5 Communication Requirements

Figure 4-1 illustrates the two types of WAN options for SPECTRUM XXI. Each option offers benefit to certain types of Client sites: permanent, high-speed connection for high-volume FMOs or intermittent (with reduced secure facility requirements) for low volume FMOs. Both types of WAN connections will interface with the Regional Server sites. The regional server sites will have both a high-speed SIPRNET connection and a bank of STU-III devices.

The recommended components for a direct SIPRNET connection include a modem and crypto equipment (furnished by DISA) and a router (furnished by the Client site).

If the Client site is supported by a base infrastructure with an existing SIPRNET access, then the SPECTRUM XXI should be connected to the Base LAN to establish SIPRNET access.

The recommended component for a remote dial-up Client site, using the Defense Switched Network (DSN) or commercial phone-line, is a STU-III capable of a 9.6 k Baud data rate.

The minimum wide-area communication link data rate required by SPECTRUM XXI Client operations is 9.6 k Baud; however, better performance will be achieved with higher data rate devices. For instance, the Lucent Technologies STU-III Secure Data Device (SDD) model 1910 has a baud rate of 14.4 k Baud that with

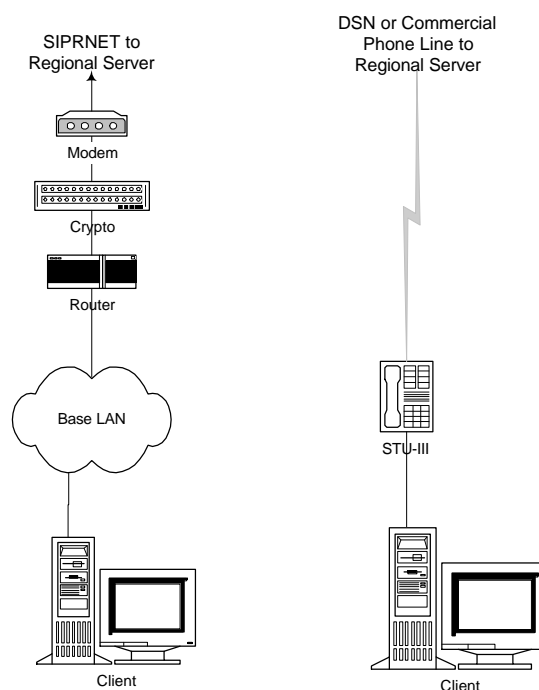


Figure 4-1. WAN Connection Types.

internal compression yields a 38.4 k Baud effective rate.

5 TRANSITION STEPS

This section provides transition guidance for existing spectrum management sites. Specifically addressed are sites with existing DCF and JSMS_w platforms. Each site expecting to transition to SPECTRUM XXI operations should prepare a site-specific transition plan.

The site transition process involves the following:

- Plan Site Transition
- Acquire Hardware/Software/Network Access
- Obtain 3rd Party Training, if required
- Implement Client Site
- Obtain SPECTRUM XXI Training
- Install SPECTRUM XXI
- Operate SPECTRUM XXI
- Decommission Legacy Equipment

Appendix A provides a set of graphics ready to be made into briefing slides for use in coordinating the SPECTRUM XXI transition within your organization. Appendix B provides a checklist to aid in the SPECTRUM XXI transition process.

5.1 Plan Site Transition

Site transition planning involves four steps to determine the SPECTRUM XXI site configuration, connectivity option, and the related impact on staffing and resources. Site transition planning includes:

- Determine Site Configuration
- Determine Site Support Requirements
- Develop Site Transition Plan
- Identify Program Resources

5.1.1 Determine Site Configuration

The SPECTRUM XXI user must first determine site configuration based on the following:

- Determine LAN Server Requirement (Subsection 4.1.1).
- Select WAN Connection Type (Subsection 4.1.2).
- Determine Client Disk Size (Subsection 4.1.3).

5.1.2 Determine Site Support Requirements

Based on the site configuration decision made, the site support requirements can be estimated. Three areas of site support include:

- Base Support, the amount depending on the site configuration and WAN connection options selected. Some FMOs do not have a sustaining base function readily available and will have to arrange for staff to meet the infrastructure requirements. If the FMO plans to manage its own

SPECTRUM XXI local infrastructure, 3rd party training in NT platforms and networks will be required.

- Staffing (Section 6).
- Training (Subsection 3.4).

5.1.3 Develop Site Transition Plan

The FMOs site-specific transition plan should, at a minimum, address the following six planning areas:

- Hardware/Software Requirements
- Incremental Cross-Over Strategy
- Training Requirements
- Milestones and Schedule
- Points-of-Contact
- Legacy System Disposition

An initial transition plan should be prepared as soon as possible and updated as the transition plan is executed. This plan will provide the necessary elements to identify the required resources and will provide a mechanism to pursue the mitigation of resource shortfalls.

5.1.3.1 Document Hardware/Software Requirements

Hardware and commercial software requirements fall into two categories: the hardware and software required to support a SPECTRUM XXI Client platform and the hardware and software required to support the selected site infrastructure.

- SPECTRUM XXI Client hardware and software requirements (addressed in Subsection 4.2).
- FMO Infrastructure Requirements - These requirements, which will be determined by the FMO's base support staff, depend on the selected site configuration. Considerations should be given to the implementation of an LAN server and any non-SPECTRUM XXI software required by the FMO, such as the LAN (router, hubs and cabling, etc.), the SIPRNET access hardware (router, crypto, and modem); and STU-III hardware.

The plan should identify the hardware and software requirements down to the component level and should include the quantity, the unit cost, and the supplier.

5.1.3.2 Determine Incremental Cross-Over Strategy

SPECTRUM XXI provides for concurrent operations within the FMO, even on the same platform. The incremental crossover strategy should identify the sequence of who or what function will start using SPECTRUM XXI first, second, etc. For example, an FMO may want to transition its below-30 MHz branch before its above-30 MHz branch, or its CONUS spectrum managers before its OCONUS spectrum managers.

The advantages of having an incremental crossover are twofold: to ease the training requirement by allowing it to be spread out over a period of time and to mitigate the risk of having the whole FMO inoperable during the transition period.

5.1.3.3 Determine Training Requirements

At a minimum, all SPECTRUM XXI users are strongly encouraged to attend the SPECTRUM XXI Client training course furnished by the JSC. Additionally, 3rd party training requirements will vary from FMO to FMO. See the appropriate subsections identified below.

- SPECTRUM XXI Training (Subsection 3.4).
- Third Party Training Requirements (Subsection 3.4). The level of 3rd party training required will be based on the selected site configuration.

5.1.3.4 Establish Milestones and Schedule

The overall SPECTRUM XXI transition at an FMO can take a considerable amount of time. For example, if an FMO decides to transition from the remote dial-up to direct SIPRNET WAN access, facility modifications might be required; accreditation of the facility and coordination with DISA for SIPRNET access will also be required.

Section 8 addresses nominal time lines associated with the major transition steps. Individual site time lines, especially when dealing with facility modifications, accreditation, and SIPRNET access, should be developed.

Appendix B provides a checklist of the entire transition process that the FMO may use to plan milestones and schedules.

5.1.3.5 Identify Points-of-Contact

The SPECTRUM XXI transition will require coordination with, or information from, a number of organizations. Below is a list of organizations that might be required to support the transition.

- JSC (Planning, Training)
- DISA (SIPRNET Access)
- National Imagery and Mapping Agency (NIMA) (Terrain and Map Data)
- Base Security Officer (Classified Processing, Accreditation / Re-accreditation)
- Base Purchasing (Hardware and Software purchases)
- Base Facilities (Facility modifications)
- Base Information Systems Management (Connection to the base infrastructure and SIPRNET access, establishing and maintaining the FMO LAN)
- Third Party Training (NT platforms and networks)

5.1.3.6 Determine Legacy System Disposition

SPECTRUM XXI replaces both the DCF and JSMS_w spectrum management systems. Hardware associated with these systems, especially hardware furnished by the JSC as part of the DCF program, requires official accounting to close the property books. If the JSC furnished hardware for your organization with JSC funds, coordinate the retirement of that equipment with the JSC and document the disposition in the site's transition plan.

5.1.4 Identify Program Resources

A primary purpose for preparing a site-specific transition plan is to identify the total resources required and to plan for obtaining the necessary resource. Resource requirements should be evaluated based on: funding, staffing, and base support. A three-step approach is recommended to satisfy the SPECTRUM XXI resource requirements.

- Identify resource requirements.
- Compare requirements to programmed resources.
- Mitigate identified resource shortfalls.

5.2 Acquire Hardware/Software/Network Access

SPECTRUM XXI is a software application that requires hardware platforms, commercial software, and WAN access to be effective. Obtaining these items is the responsibility of the Client organization. The Client organization must obtain these items based on its local procedures and customs. The following subparagraphs provide a nominal strategy that must be tailored based on local circumstances.

5.2.1 Acquire Hardware/COTS Software

After the Client organization has determined the site, platform, and WAN configurations, it can assimilate and compile the full set of hardware and COTS software required to support its spectrum management site. This compilation should be prepared in the locally accepted format and forwarded to the appropriate purchasing office.

5.2.2 Secure Area

SPECTRUM XXI is designed to operate connected to the SIPRNET WAN. This may be accomplished through a direct SIPRNET connection or through a remote dial-up using a STU-III. The remote dial-up mode is not recommended for Client sites that have a large volume of spectrum management transactions unless implemented as a SIPRNET backup capability (Subsection 4.1.2).

The following steps should be accomplished to prepare the Client site for classified data processing. Refer to Subsection 4.3.1 for additional information on classified data processing.

- Determine Changes in Existing Operations - The Client organization must decide on the mode of WAN connection required at its site.
- Coordinate Requirements with Base Security Officer - The base security officer should be contacted to coordinate any change in classified data processing (platforms, software, intended WAN connections) occurring within the Client's organization.
- Determine Required Facility and Procedural Upgrades - The Client organization, in conjunction with the base security officer, and potentially their Designated Accreditation Authority (DAA), will specify any facility or procedural updates required to support its selected mode of SPECTRUM XXI operations.
- Request Required Facility Upgrades - If a change in the facility is required, the Client organization will have to forward a request to the group responsible for managing and implementing the required changes. Since facility modifications are often very time consuming and require advance funds programming, the Client organization should consider using the remote dial-up capability until modifications can be programmed and completed.

-
- Prepare Accreditation/Re-accreditation Documents - Any changes in the classified data processing environment (hardware, software, and intended WAN connections) will most likely require approval by the local DAA. The SPECTRUM XXI transition plan for the Client organization should be fully coordinated with the base security officer and the local DAA to determine what degree of accreditation or re-accreditation is required. The Client organization will be responsible for preparing and submitting the necessary accreditation or re-accreditation documentation.
 - Arrange Accreditation Site Inspection - A site inspection is typically part of the accreditation or re-accreditation approval process. The Client organization, in conjunction with the base security officer, will coordinate this inspection.

5.2.3 Coordinate SIPRNET Requirements with Base Network Manager

After accreditation or re-accreditation approval has been received, the Client organization should pursue its WAN connection. The Client organization should determine if the sustaining base already has SIPRNET access or is planning to obtain access within the SPECTRUM XXI transition time frame. Coordination with the base network manager will be required to access the existing or planned base infrastructure.

- Coordinate SIPRNET Requirement with DISA - SIPRNET access is controlled by DISA. The SPECTRUM XXI connection will require coordination through the base network manager.
- Coordinate STU-III Requirement - Since STU-IIIs are controlled devices, acquisition and activation of a STU-III will require coordination with the base Communications Security (COMSEC) custodian.

5.2.4 Schedule SPECTRUM XXI Training

The JSC will offer SPECTRUM XXI training courses as part of the transition process. The Client organization must obtain training in SPECTRUM XXI to successfully apply it to their spectrum management operations. Section 3.4.1 provides more details on the JSC furnished training.

- Coordinate JSC Courses - Prior to transition to IRFMS, the SPECTRUM XXI courses will be offered at the JSC facility in Annapolis, MD and to selected central sites. (See section 8.)
- Determine Training Requirements/Class Type - The Client organization should compile and plan its total set of the SPECTRUM XXI training. It is strongly recommended that all SPECTRUM XXI users obtain the appropriate training.
- Schedule Class Attendance - The JSC will maintain an Internet web page, providing course descriptions, schedules, and available classes, to facilitate the Client organization's course registration.

5.3 Obtain 3rd Party Training

It is recommended that the Client organization become familiar with SPECTRUM XXI hardware and COTS software products. This is especially important for Client organizations opting for a LAN server as part of their site configuration.

- Obtain 3rd Party Training in Hardware, COTS software, and NT Networks - For Client sites implementing a LAN server, it will be necessary to designate a LAN administrator. Depending upon the individual's experiences, training in Microsoft NT and Microsoft Networks may be

required. Commercial courses are available to meet this requirement. See Subsection 3.4.2 for the course recommendations.

5.4 Implement Client Site

5.4.1 Install Hardware/COTS Software

The Client organization is responsible for installing the SPECTRUM XXI hardware it procures.

- Install FMO Infrastructure Upgrades - For Client sites opting for a LAN server, it is recommended that the LAN server and FMO LAN be fully operational and tested before installing the SPECTRUM XXI software. A Client organization may decide to contract the installation of their LAN server and LAN or have the installation done by their trained system administrator. Base support may also be able to help in the installation of the FMO LAN.
- Install SPECTRUM XXI Client Platforms - Typical steps include setting up the individual Client platforms, loading the acquired COTS software products, and connecting to the SPECTRUM XXI WAN access.

5.4.2 Determine Site Readiness

Prior to the installation of SPECTRUM XXI, the correct operations of each Client platform, the FMO LAN (if implemented), and the WAN access should be verified.

- Run Hardware, Software, and LAN Diagnostics - Diagnostic packages provided with the commercial hardware and software should be run to verify operations and to establish a baseline for future diagnostics. Similar diagnostics should be run and recorded for the LAN operations.
- Determine WAN Availability - The WAN access should be thoroughly scripted, tested, and documented prior to installing the SPECTRUM XXI application.

5.5 Obtain SPECTRUM XXI Training

Prior to installation of the SPECTRUM XXI software, the Client user should attend SPECTRUM XXI training.

5.6 Install SPECTRUM XXI

Installing SPECTRUM XXI is a four-step process: installing the SPECTRUM XXI software, mapping the user's existing spectrum management data, establishing a WAN user account and profile, and installing the background frequency assignment data.

5.6.1 Install SPECTRUM XXI software

- Install SPECTRUM XXI Client Application - SPECTRUM XXI will be loaded as a standard Windows NT application from a CD-ROM furnished from the JSC.

5.6.2 Map Databases

SPECTRUM XXI provides a mechanism to preserve the current working files for both the DCF and JSMS_W users. Table 5-1 shows the JSMS_W data sets and their preservation during SPECTRUM XXI installation.

Table 5-1. JSMS_W User File Preservation.

JSMSW 3.0 Data Set ^A	Record Types	User Action	Installation Software	SPECTRUM XXI Data Set
Frequency Records	Permanent Assignments	Import CD-FARS & GMF	Mapped During Installation	Frequency Records
	Proposals (Previously Loaded onto DCF) ^B	n/a	n/a	
	Proposals (Not Previously Loaded onto DCF)	n/a	Mapped During Installation	
	Temporary Assignments	n/a	Mapped During Installation	
JRFL	All	n/a	Mapped During Installation	JRFL
Allotment Plans	User Created	n/a	Mapped During Installation	Allotment Plans
	National Channel Plans ^C	n/a	National Channel Plans ^C	
Frequency Schedules	All	n/a	Mapped During Installation	Frequency Schedules
Interference Reports	All	n/a	Mapped During Installation	Interference Reports
Spectrum Certification Data	Standard Database ^D	n/a	Standard Database ^D	Spectrum Certification Data
	User Entered	n/a	Mapped During Installation	
Satellite Data	Standard Database ^E	n/a	Standard Database ^E	Satellite Data
	User Entered	n/a	Mapped During Installation	
Standardization Data	Standard Database ^F	n/a	Standard Database ^F	Standardization Data
	User Entered	n/a	Mapped During Installation	
Geographical Data	Terrain Elevation	n/a	n/a	Geographical Data
	Map Feature	n/a	n/a	

^A - Updated Allocation Tables and Sun Spot tables will be provided with SPECTRUM XXI IOC

^B - Do not submit proposals through both the DCF and SPECTRUM XXI processing paths

^C - AN updated National Allotments will be provided with SPECTRUM XXI IOC

^D - An updated set of approved J/F-12s will be provided with SPECTRUM XXI IOC

^E - An updated table of satellite data will be provided with SPECTRUM XXI IOC

^F - Updated Standardization Tables will be provided with SPECTRUM XXI IOC

Table 5-2 shows the types of DCF records and their preservation during SPECTRUM XXI installation.

Table 5-2. DCF User File Preservation

DCF Data Set	Record Types	User Action	Installation Software	SPECTRUM XXI Data Set
Frequency Records	Permanent Assignments	Import CD-FARS & GMF	n/a	Frequency Records
	Proposals (Previously Loaded onto DCF) ^A	n/a	n/a	
	Short-Term Assignments	Export and Import in SFAF	n/a	

^A - Do not submit proposals through both the DCF and SPECTRUM XXI processing paths

Each SPECTRUM XXI site is expected to acquire terrain elevation data from National Imagery and Mapping Agency (NIMA). Each SPECTRUM XXI site should contact NIMA to establish a distribution account to receive their required data.

5.6.3 Establish Client Account and Data Profiles

Data distribution within SPECTRUM XXI, except for frequency proposal and assignment notification transactions, is accomplished using a Client profile. The profile defines what data the user wants and indicates how often that data should be updated. To establish a profile, the Client must first establish a user account with the platform that will furnish the data.

The establishing of Client Server accounts and profiles will be covered in detail during the Client training furnished by the JSC.

5.6.4 Install Background Assignment Data

Once the SPECTRUM XXI application is installed and the user's data is mapped and profiled, the user should import the initial background frequency assignment environment into his/her SPECTRUM XXI database. This will be accomplished using a set of JSC furnished CD-ROMs, which will contain: FRRS, FCC, and ITU assignments. The NTIA provides a CD-ROM which contains the GMF and monthly updates to GMF records. The Canadian data file, the ARFA/MRFL, and Radio Astronomy data files are available from the JSC in SFAF format.. Instruction on how to load this data will be provided during the JSC furnished SPECTRUM XXI training.

5.7 Operate SPECTRUM XXI

The operation of SPECTRUM XXI at a Client site should be viewed as two phases, in accordance with the incremental crossover strategy defined in the user's transition plan.

- Begin Initial Operations - SPECTRUM XXI Client site operations are begun by a few staff members of a multiple person FMO or for a limited set of transactions for a single person FMO.
- Begin Full Operations - All spectrum management activities are shifted to SPECTRUM XXI operations and the legacy system use is terminated.

5.8 Decommission Legacy Equipment

In accordance with the Client site transition plan and once full SPECTRUM XXI operations are in place, the legacy equipment should be decommissioned. The complexity of this will depend on ownership of the equipment and local situations.

- Decommission DCF Equipment - DCF equipment furnished by the JSC and remaining on their property book will be disposed of and documented in accordance with a Memorandum of Understanding (MOU) to be established between the Client site and the JSC.
- Decommission JSMS_w Equipment - The disposition of JSMS_w equipment acquired by the Client organization will be at the determination of the Client organization.

6 STAFFING REQUIREMENTS

SPECTRUM XXI has been designed to minimize the amount of support staff required to maintain DoD spectrum management automation. The staff support required for the three types of SPECTRUM XXI sites is identified below, along with the areas in which the staff should maintain proficiency.

6.1 Regional Server Sites

The JSC and the host organization will jointly maintain Regional Server sites. The JSC will remotely maintain the system administration aspects of the Regional Server, its associated databases, and its accounts. Periodic site visits will be made to ensure the efficient operation of the Regional Servers. Regional Server sites, due to their placement at major spectrum management offices, will be assumed to be operated on a LAN at the regional site.

The Regional Server sites will therefore require hardware and network administration to be provided by an Information Management/Information System (IM/IS) specialist from the regional server organization. The IM/IS specialist will be required to be proficient in the administration and diagnostics associated with NT platforms, the NT operating system, and NT networks. This staffing requirement will average approximately 10 hours per week and, potentially, can be shared with other sustaining base requirements.

SPECTRUM XXI Client users at the regional site should be frequency management specialists who are proficient in both spectrum management and SPECTRUM XXI operations. SPECTRUM XXI proficiency can be attained by attending the SPECTRUM XXI training.

6.2 Client Sites with LAN Servers

Client sites electing to implement a LAN server will be responsible for the installation and maintenance of the server and the associated FMO LAN.

The LAN server sites will require hardware and network administration to be provided by an IM/IS specialist. The IM/IS specialist will be required to be proficient in the administration and diagnostics associated with NT platforms, the NT operating system, and NT networks. This staffing requirement will average approximately 10 hours per week and, potentially, can be shared with other sustaining base requirements. (Note, this requirement does not add to the requirement for Regional Server sites.)

SPECTRUM XXI Client users at the LAN server site should be frequency management specialists who are proficient in both spectrum management and SPECTRUM XXI operations. SPECTRUM XXI proficiency can be attained by attending SPECTRUM XXI training courses.

6.3 Client Sites

Client sites without LAN servers will not require system administration beyond the proficiency achieved by the spectrum management staff during the SPECTRUM XXI Client user courses.

SPECTRUM XXI Client users should be frequency management specialists who are proficient in both spectrum management and SPECTRUM XXI operations. SPECTRUM XXI proficiency can be attained by attending SPECTRUM XXI training courses.

7 RESPONSIBILITIES

The SPECTRUM XXI development, deployment, and operations involve joint responsibility spanning the entire spectrum management community. The following sections highlight major responsibilities associated with each organization.

7.1 JSC

The JSC is responsible for the following activities:

- Develop, field, and maintain the SPECTRUM XXI software system.
- Provide SPECTRUM XXI post deployment support.
- Assist with hardware, network, and Regional Server database operations via the network.
- Acquire, install, and maintain the Central Server.
- Acquire, install, and maintain the Regional Servers in conjunction with the host sites.
- Develop and teach SPECTRUM XXI training courses.
- Support SPECTRUM XXI training at the IRFMS.
- Synchronize SPECTRUM XXI and the Army's BSM training activities at Ft Gordon.

7.2 Regional Server Site Organizations

The SPECTRUM XXI Regional Server Site Organizations are responsible for the following activities:

- Develop a site-specific transition plan.
- Ratify a MOU with the JSC, specifying the Terms of Reference for Regional Server installation and operations.
- Provide a part-time system administrator.
- Establish and maintain system administrator proficiency.
- Acquire, install, and maintain a secure LAN with a SIPRNET connection.
- Comply with base security requirements
- Acquire or amend a site accreditation plan which includes the Regional Server platform and Client platforms.
- Acquire, install, and maintain Client platforms.
- Budget for user training. (TDY expenses only – the training is free.)
- Coordinate the disposition of DCF equipment with the JSC.

7.3 Client Site Organizations Implementing a LAN Server

Organizations implementing a LAN Server are responsible for the following activities:

- Develop a site-specific transition plan.
 - Provide a part-time system administrator.
 - Establish and maintain system administrator proficiency.
 - Acquire, install, and maintain a secure LAN with a SIPRNET connection.
 - Comply with base security requirements.
 - Acquire, install, and maintain Client platforms.
 - Budget for user training. (TDY expenses only – the training is free.)
-

-
- Identify and coordinate training requirements with the JSC during the transition period.
 - Coordinate the disposition of DCF equipment with the JSC.

7.4 Client Site Organizations

The SPECTRUM XXI Client Site Organizations are responsible for the following activities:

- Develop a site-specific transition plan.
- Acquire, install, and maintain Client platforms.
- Acquire, install, and maintain a secure WAN access via SIPRNET or STU-III connections.
- Comply with base security requirements.
- Budget for user training. (TDY expenses only – the training is free.)
- Identify and coordinate training requirements with the JSC during the transition period.

8 TIME LINES

SPECTRUM XXI fielding depends on a number of factors, such as installation priorities and Client site readiness. The SPECTRUM XXI installation priority, as reflected in the overall transition strategy, focuses on a parallel fielding of SPECTRUM XXI to the CINCs and Services.

Other factors influencing the specific transition time for a given FMO are hardware and COTS software acquisition, as well as SIPRNET access, training, and system installation. These factors should be addressed prior to SPECTRUM XXI fielding.

8.1 Overview

An overview of the SPECTRUM XXI IOC fielding time lines are shown in Figure 8-1. Each SPECTRUM XXI site is encouraged to address their transition requirements prior to the actual fielding of SPECTRUM XXI. Parallel fielding of SPECTRUM XXI to the CINCs and Services is planned for FY00. At the end of FY00 the decommissioning of the DCFs is planned.

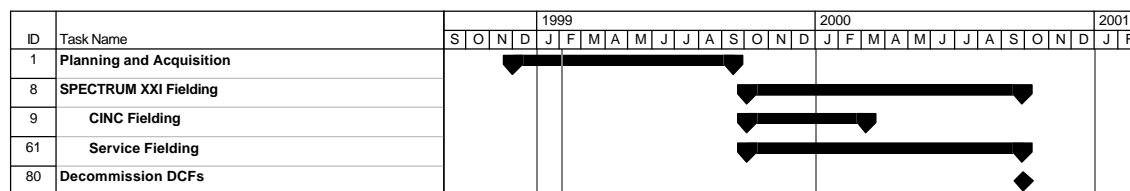


Figure 8-1. SPECTRUM XXI Fielding Schedule Overview.

8.2 Planning and Acquisition Time Lines

Each organization planning to use SPECTRUM XXI should update their transition plans upon receipt of this document. Figure 8-2 provides the steps and time lines for the planning and acquisition phase. These steps should be completed prior to the deployment of SPECTRUM XXI at the user's site.

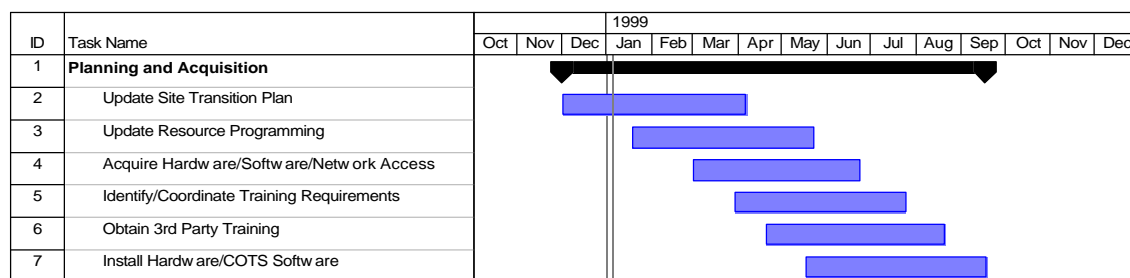


Figure 8-2 Planning and Acquisition Schedule.

8.3 CINC Fielding Schedule

Specific time lines have been established for CINC fielding schedule and are shown in Figure 8-3. Each CINC's fielding schedule will be provided in detail in the following sections.

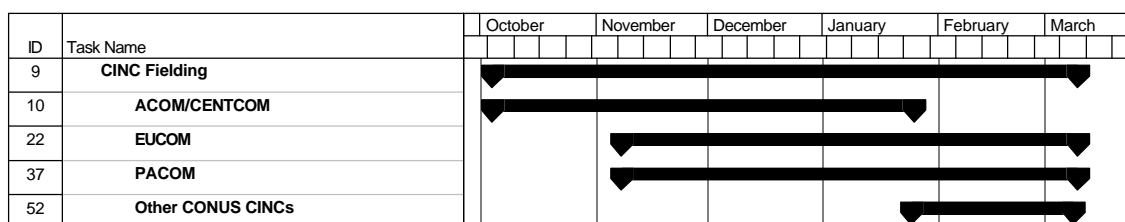


Figure 8-3. CINC Fielding Schedule.

8.3.1 ACOM/CENTCOM Support

This fielding segment is intended to address ACOM, CENTCOM, and their supported ARFOR, AFFOR, NAVFOR, MARFOR, SOCFOR clients. Figure 8-4 provides the details of the planned installation and training support at ACOM. A team from the JSC will visit ACOM from 6 October through 12 October 1999 to install SPECTRUM XXI at ACOM. Two training classes will be provided. Class #1 will be conducted from 15 October through 27 October 1999. Class #2 will be conducted from 28 October through 9 November 1999. Each class can train 12 SPECTRUM XXI users. This schedule provides for two 9 day classes that can be configured by ACOM and CENTCOM to provide training emphasis and hands-on experience in the functional capabilities of most importance to the SPECTRUM XXI users. The exact sequence of training provided at ACOM will be coordinated with the JSC prior to SPECTRUM XXI fielding. (See Appendix C for a planning checklist.)

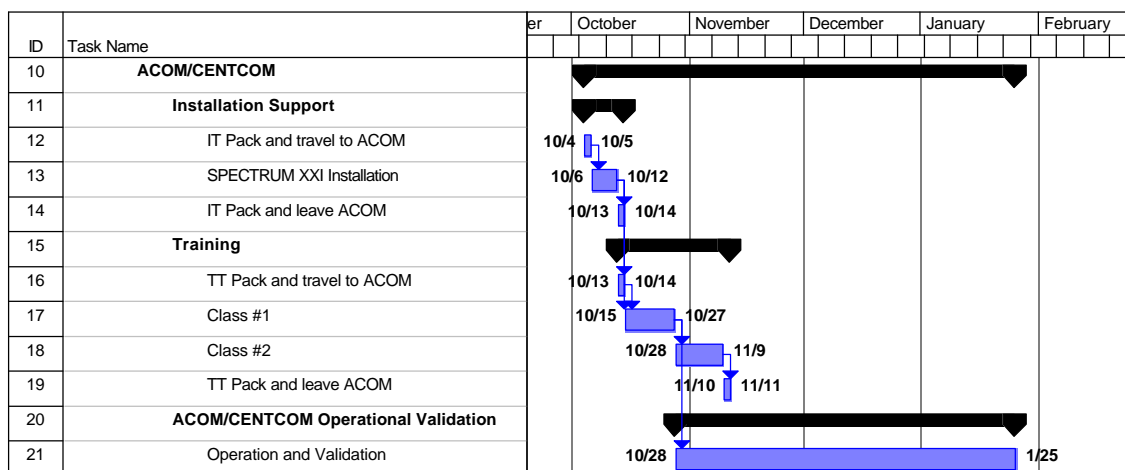


Figure 8-4. ACOM/CENTCOM Fielding Schedule.

After the training, ACOM and CENTCOM will conduct operational validation of SPECTRUM XXI. During this time the JSC will work closely with ACOM and CENTCOM to ensure all system shortcomings or enhancements identified by ACOM and CENTCOM are documented and reported to the configuration control board. If remedial software changes are required between planned SPECTRUM XXI releases, they will be furnished on the SPECTRUM XXI home page or provided on a CD-ROM if necessary.

8.3.2 EUCOM Support

This fielding segment is intended to address EUCOM and their supported ARFOR, AFFOR, NAVFOR, MARFOR, SOCFOR clients. Figure 8-5 provides the details of the planned installation and training support at EUCOM. A team from the JSC will visit EUCOM from 11 November through 17 November 1999 to install the SPECTRUM XXI Regional Server and clients at EUCOM. Two training classes will be provided. Class #1 will be conducted from 1 December through 13 December 1999. Class # 2 will be conducted from 6 January 2000 through 18 January 2000. Each class can train 12 SPECTRUM XXI users. This schedule provides for two 9 day classes that can be configured by EUCOM to provide training emphasis and hands-on experience in the functional capabilities of most importance to the SPECTRUM XXI users. The exact sequence of training provided at EUCOM will be coordinated with the JSC prior to SPECTRUM XXI fielding. (See Appendix C for a planning checklist.)

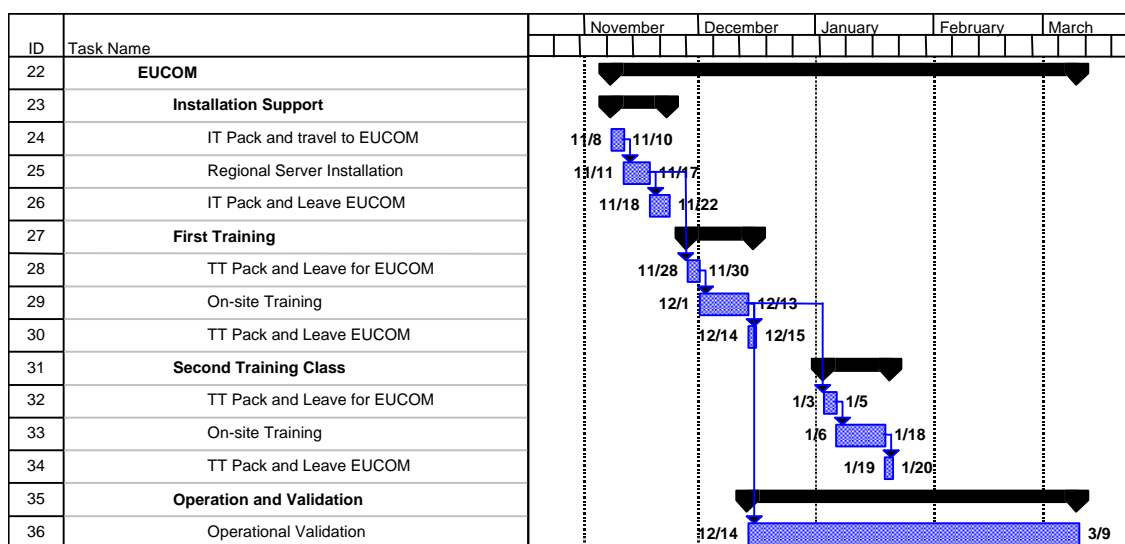


Figure 8-5. EUCOM Fielding Schedule.

After the training, EUCOM will conduct operational validation of SPECTRUM XXI. During this time the JSC will work closely with EUCOM to ensure all system shortcomings or enhancements identified by EUCOM are documented and reported to the configuration control board. If remedial software changes are required between planned SPECTRUM XXI releases, they will be furnished on the SPECTRUM XXI home page or provided on a CD-ROM if necessary.

8.3.3 PACOM Support

This fielding segment is intended to address JFMO Japan, JFMO Korea, PACOM and their supported ARFOR, AFFOR, NAVFOR, MARFOR, SOCFOR clients. Figure 8-6 provides the details of the planned installation and training support at PACOM. A team from the JSC will visit PACOM from 11 November through 17 November 1999 to install the SPECTRUM XXI Regional Server and clients at PACOM. Two training classes will be provided. Class #1 will be conducted from 1 December through 13 December 1999. Class # 2 will be conducted from 6 January 2000 through 18 January 2000. Each class can train 12 SPECTRUM XXI users. This schedule provides for two 9 day classes that can be configured by PACOM to provide training emphasis and hands-on experience in the functional capabilities of most importance to the SPECTRUM XXI users. The exact sequence of training provided at PACOM will be coordinated with the JSC prior to SPECTRUM XXI fielding. (See Appendix C for a planning checklist.)

After the training, PACOM will conduct operational validation of SPECTRUM XXI. During this time the JSC will work closely with PACOM to ensure all system shortcomings or enhancements identified by PACOM are documented and reported to the configuration control board. If remedial software changes are required between planned SPECTRUM XXI releases, they will be furnished on the SPECTRUM XXI home page or provided on a CD-ROM if necessary.

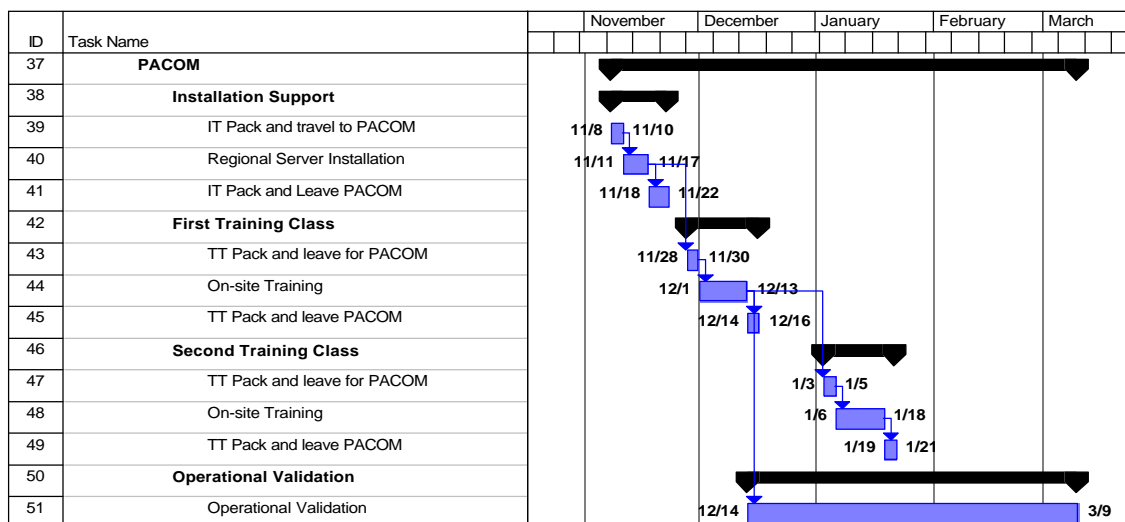


Figure 8-6. PACOM Fielding Schedule.

8.3.4 Other CONUS CINCs Support

This fielding segment is intended to the other CONUS CINCs including CINCSOU, CINCSOC, CINCSpace and their clients. Figure 8-7 provides the details of the planned training support of the CONUS CINCs. Two training classes will be provided. Class #1 will be conducted from 27 January through 8 February 2000. Class # 2 will be conducted from 23 February through 6 March 2000. The location of the training classes will be determine by the CONUS CINCs and the JSC. Each class can train 12 SPECTRUM XXI users. This schedule provides for two 9 day classes that can be configured by the CONUS CINCs to provide training emphasis and hands-on experience in the functional capabilities of most importance to the SPECTRUM XXI users. The exact sequence of training provided at the CONUS

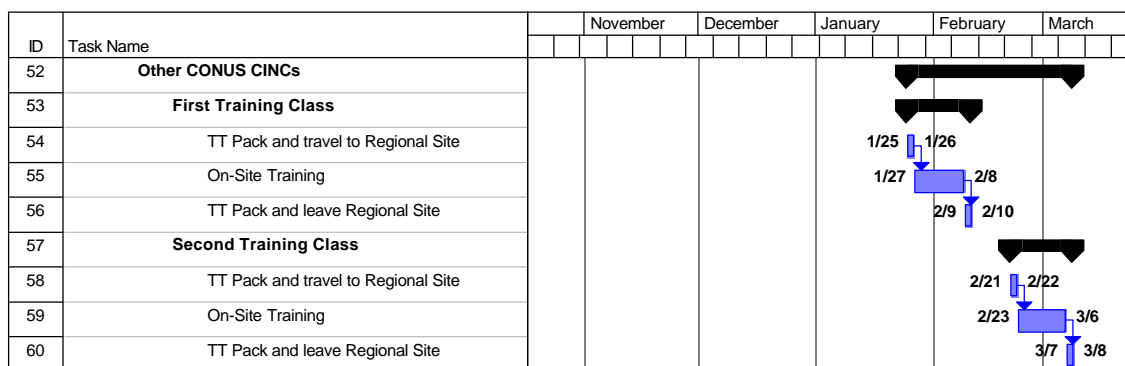


Figure 8-7. Other CONUS CINCs Fielding Schedule.

CINCs will be coordinated with the JSC prior to SPECTRUM XXI fielding. (See Appendix C for a planning checklist.)

8.4 Joint Service Fielding Schedule

Specific classes have been established for Service fielding schedule and are shown in Figure 8-8. This plan provides 12 Joint Service training classes at the JSC within the first 12 months of SPECTRUM XXI fielding. Each class can train 12 SPECTRUM XXI users, nominally four Army users, four Navy/Marine Corps users, and four Air Force users per class.

The Services are expected to schedule and coordinate the training of their headquarters, command, and field office clients to accommodate an orderly transition to SPECTRUM XXI operations.

The Navy is expected to schedule training objectives from within the allocated course times for the NAVEMSCEN, WAFC, Marine HQ, SPAWAR, NAVSEA, NAVAIR, NAVSTA, Fleet, Marine Base, and MEF frequency managers. (See Appendix C for a planning checklist.)

The Air Force is expected to schedule training objectives from within the allocated course times for the AFFMA, ACC, AFMC, other Major Commands, AFC (Eastern, Gulf, Nellis), AFB, and Wing frequency managers. (See Appendix C for a planning checklist.)

The Army is expected to schedule training objectives from within the allocated course times for the CESO, AFMO CONUS, AMC, other Major Commands, AFC (WSMR, Ft. Huachuca), DOIM, Signal Unit, COE HQ, COE Divisions, and COE Districts frequency managers. (See Appendix C for a planning checklist.)

After the first Joint Service training class, the JSC will be available to support the installation of SPECTRUM XXI at the collocated frequency management offices and OSAM. This dedicated support will be available from 18 October through 29 October 1999. After that period, installation support will be available upon request from the JSC.

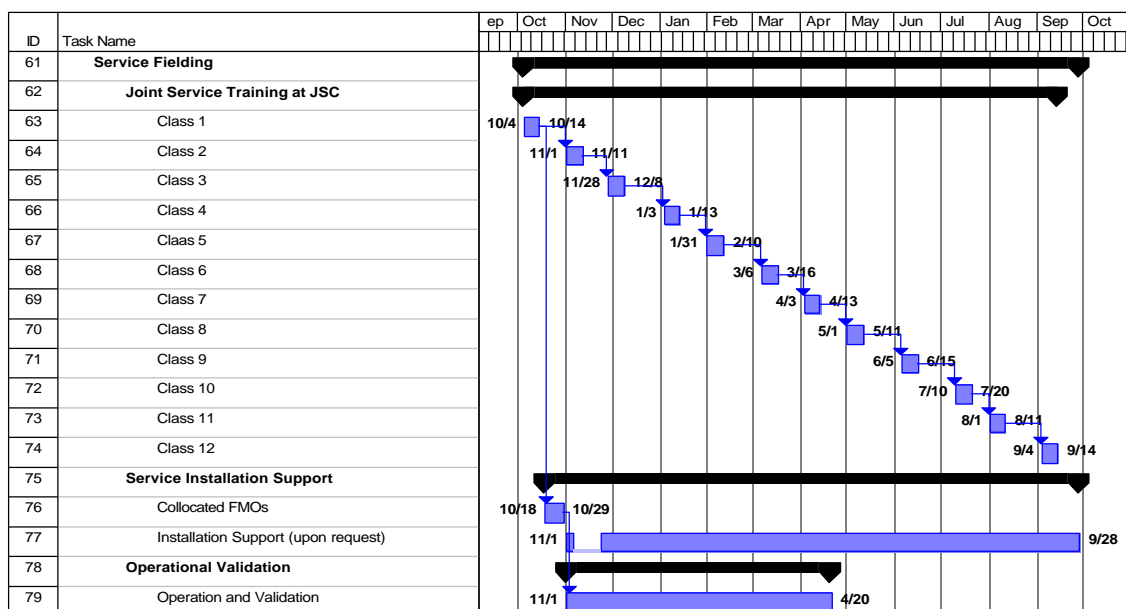


Figure 8-8. Joint Service Training Schedule.

Beginning 1 November 1999 and continuing through 20 March 2000 the Services will conduct operational validation of SPECTRUM XXI. During this time the JSC will work closely with Services to ensure all system shortcomings or enhancements identified by Services are documented and reported to the configuration control board. If remedial software changes are required between planned SPECTRUM XXI releases, they will be furnished on the SPECTRUM XXI home page or provided on a CD-ROM if necessary.

8.5 Regional Training

After the initial, pre-planned, training is accomplished regional training will be available. Beginning in February 2000 the JSC, upon request, will conduct regional training at sites convenient to groups of SPECTRUM XXI users. The JSC will be able to support up to one 9day training class per month. The locations and dates will depend on the user's demand for training. Information about upcoming regional training classes will be maintained on the SPECTRUM XXI home page.

The JSC will maintain a portable training package that will include all the computers and networking equipment required to train SPECTRUM XXI. The sites selected for regional training will have to support the training of up to twelve students and two instructors.

8.6 DCF Decommissioning

The SPECTRUM XXI transition plan provides a five month period to conduct SPECTRUM XXI operations after operational validation and prior to the decommissioning of the DCFs on 29 September 2000. It is important to obtain SPECTRUM XXI software and training before the DCFs are decommissioned.

9 RISK ASSESSMENT AND CONTINGENCY PLANS

The SPECTRUM XXI transition strategy is formulated to reduce the risk associated with introducing the system. The following sections address potential development and deployment risks and the SPECTRUM XXI design and transition strategy mitigation of that risk.

9.1 Software Development

Two potential risk categories associated with SPECTRUM XXI software development activities include:

- Software Development is Delayed
- Software Does Not Meet Requirements

The mitigation of these risks will be that both the DCFs and JSMS_w will be sustained until SPECTRUM XXI is operational.

9.2 Hardware Acquisition

Two potential risk categories associated with SPECTRUM XXI hardware and COTS software acquisition by the Client sites include:

- Client hardware is received before SPECTRUM XXI is available
- Client hardware can not be acquired in FY98-99

The mitigation of these risks will be that JSMS_w will run on SPECTRUM XXI Client platform, and JSMS_w can exchange ASCII SFAF with SPECTRUM XXI.

9.3 Wide-Area Networking

Three potential risks categories associated with SPECTRUM XXI WAN usage include:

- The base-wide LAN connection is not available to the FMO
- The FMO's SIPRNET connection is unreliable
- The Client user cannot forward the proposal, receive the assignment, or exchange data

The mitigation of these risks will be that Client users can acquire the STU-III connection option. SPECTRUM XXI WAN performance will depend on the quality of the WAN connections. It is the user's responsibility to ensure the WAN connections are adequate.

10 GLOSSARY

AFC	Area Frequency Coordinator
AOR	Area of Responsibility
ASCII	American National Standard Code for Information Interchange
BEI	Background Environment Information
BPCS	Base, Post, Camp, and Station
BSM	Battlefield Spectrum Management
BSMC	Battlefield Spectrum Management Course
CCF	Central Computing Facility
CD-FARS	Compact Disc-Frequency Assignment Retrieval System
CEOI	Communications-Electronics Operating Instruction
CINC	Commander-in-Chief
COE	Corps of Engineers; also Common Operating Environment
CONUS	Continental United States
COMSEC	Communications Security
COTS	Commercial-off-the-Shelf
DAA	Designated Accreditation Authority
DCF	Distributed Computer Facility
DII	Defense Information Infrastructure
DISA	Defense Information Systems Agency
DMS	Defense Message System
DoD	Department of Defense
DSN	Defense Switched Network
E3	Electromagnetic Environment Effects
EMC/V	Electromagnetic Compatibility/Vulnerability
EW	Electronic Warfare
FCC	Federal Communications Commission
FMFO	Frequency Management Field Office
FMO	Frequency Management Office
FRRS	Frequency Resource Record System
GCCS	Global Command and Control System
GMF	Government Master File
IKP	Instructor and Key Personnel
IM/IS	Information Management/Information System
IOC	Initial Operating Capability
IRFMS	Interservice Radio Frequency Management School
ITU	International Telecommunication Union
J2	Joint Staff, Intelligence Directorate
J3	Joint Staff, Operations Directorate
J6	Joint Staff, Communications and Computer Systems Directorate
JNS	JSC/NTIA Server
JRFL	Joint Restricted Frequency List
JSC	Joint Spectrum Center
JSM WG	Joint Spectrum Management Working Group
JSMS _w	Joint Spectrum Management System for Windows
JTF	Joint Task Force
LAN	Local Area Network
MOU	Memorandum of Understanding

MSE-NPT	Mobile Subscriber Equipment-Network Planning Terminal
MUES	Management and Use of the Electromagnetic Spectrum
NIMA	National Imagery and Mapping Agency
NTIA	National Telecommunications and Information Administration
RBECS	Revised Battlefield Electronic CEOI System
SC	Spectrum Certification
SCS	Spectrum Certification System
SCSI	Small Computer System Interface
SDD	Secure Data Device
SFAF	Standard Frequency Action Format
SIPRNET	Secret Internet Protocol Router Network
STU	Secure Telephone Unit
TACSYS	Tactical Systems
UFS	User Furnished Software
WAN	Wide-Area Network

Appendix A
SPECTRUM XXI Coordination Slides

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SPECTRUM XXI Coordination

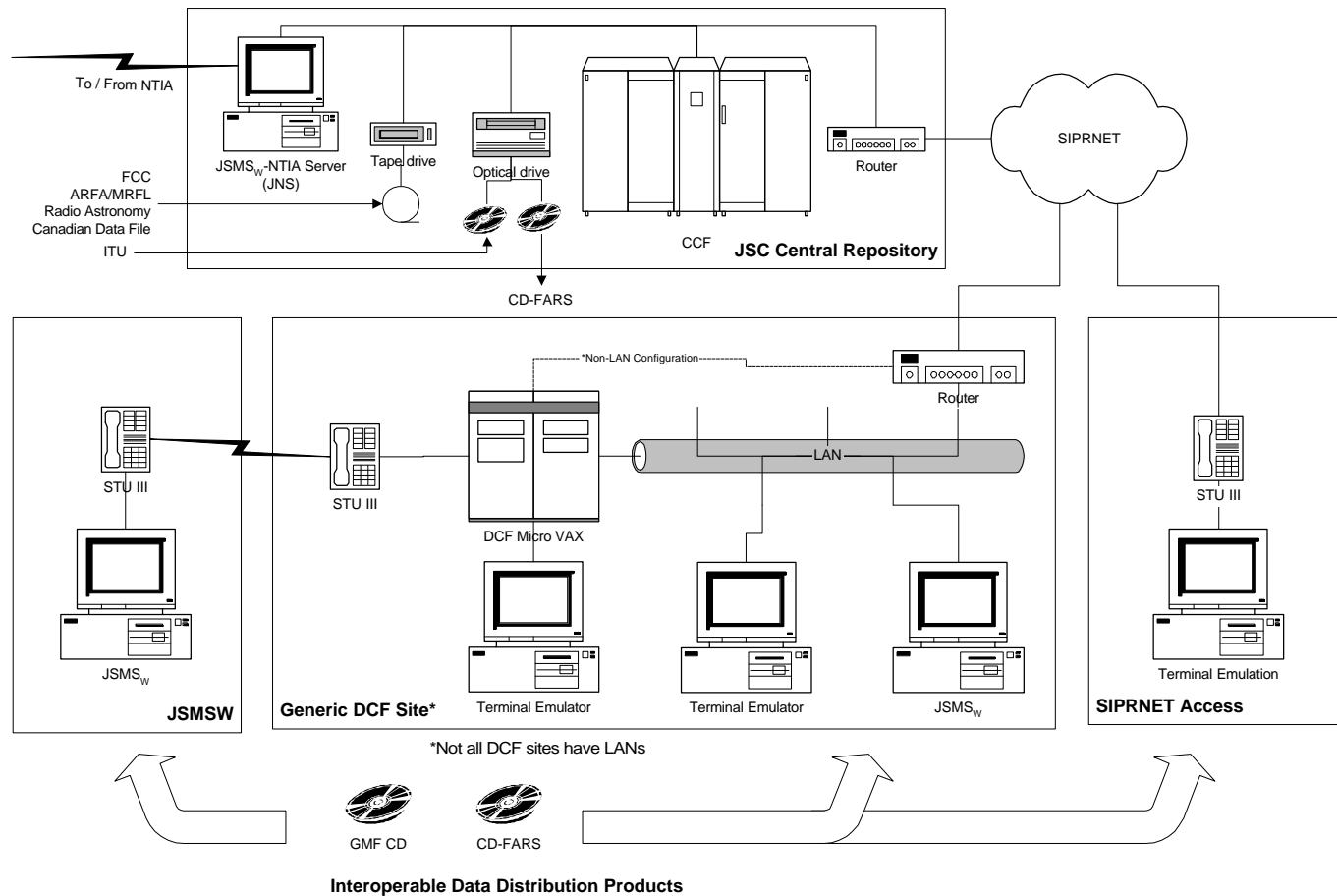


Joint Spectrum Center

Unclassified

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Current System Configuration

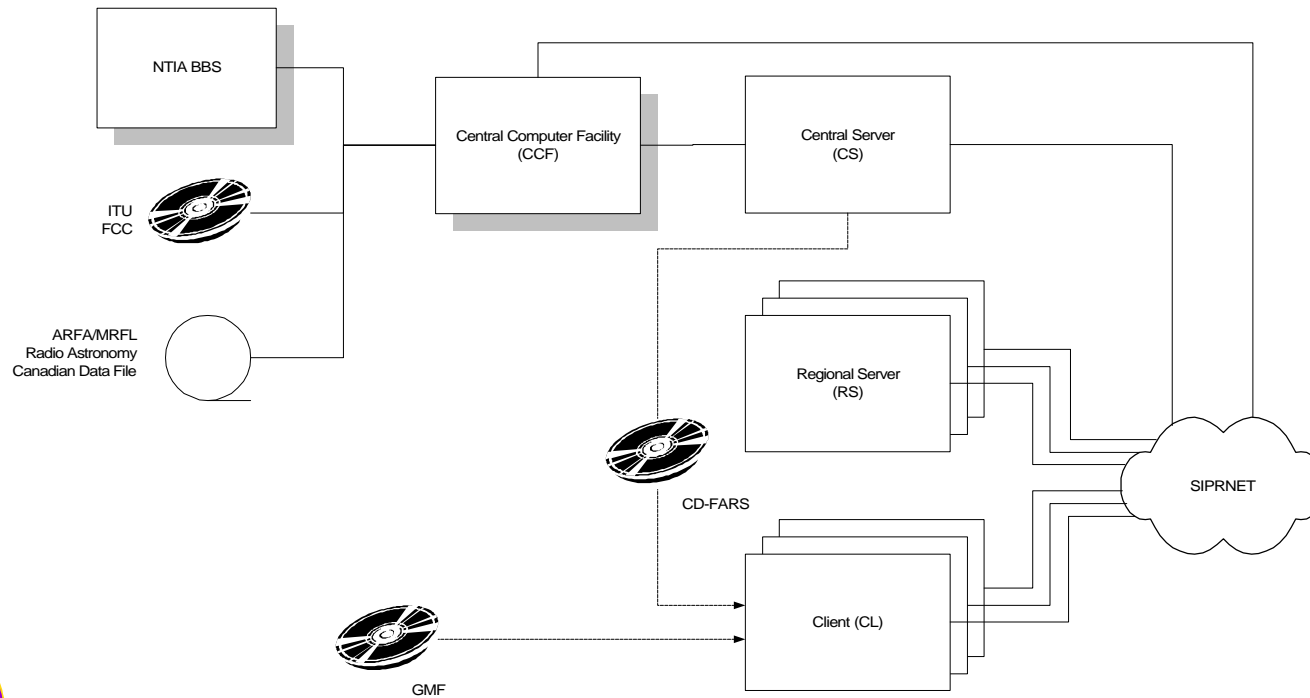


Joint Spectrum Center

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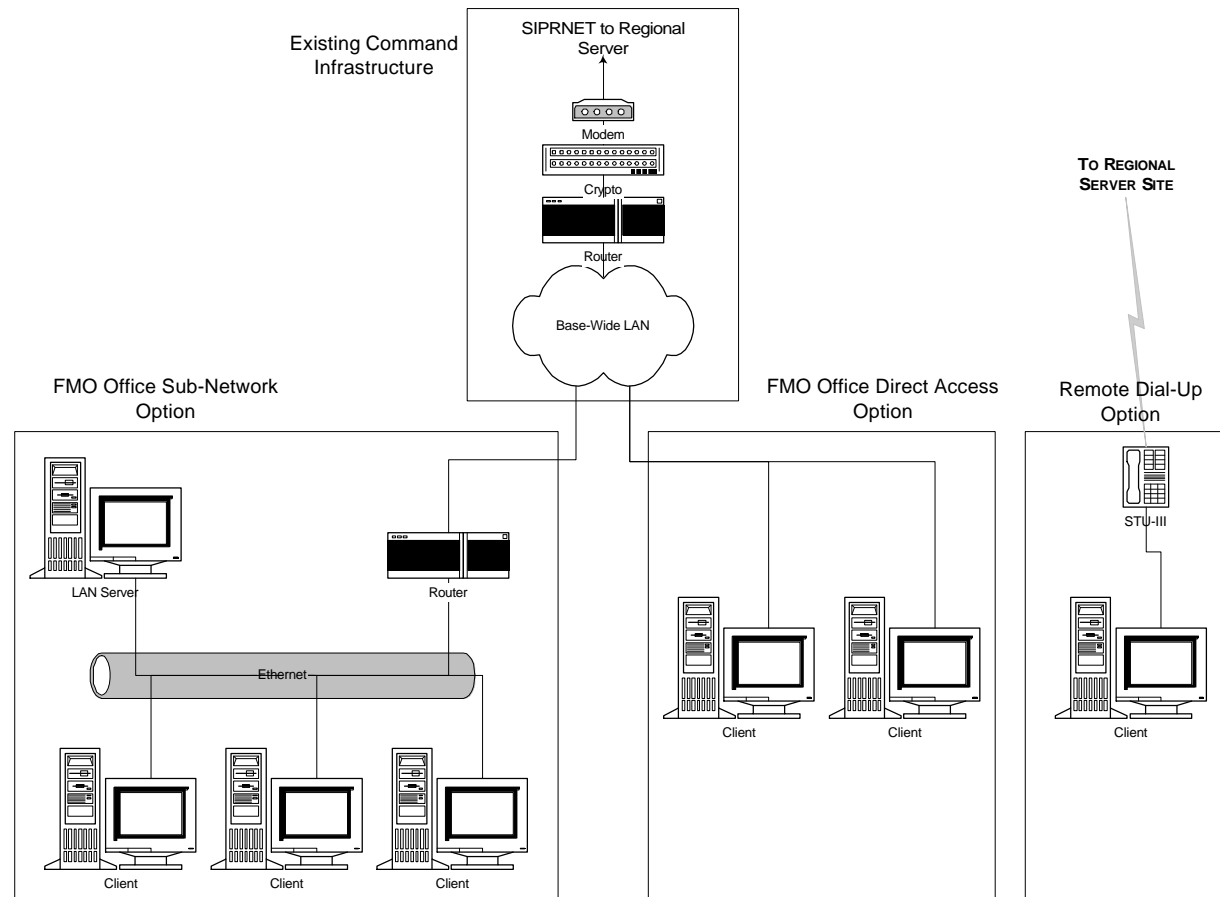
SPECTRUM XXI System Configuration



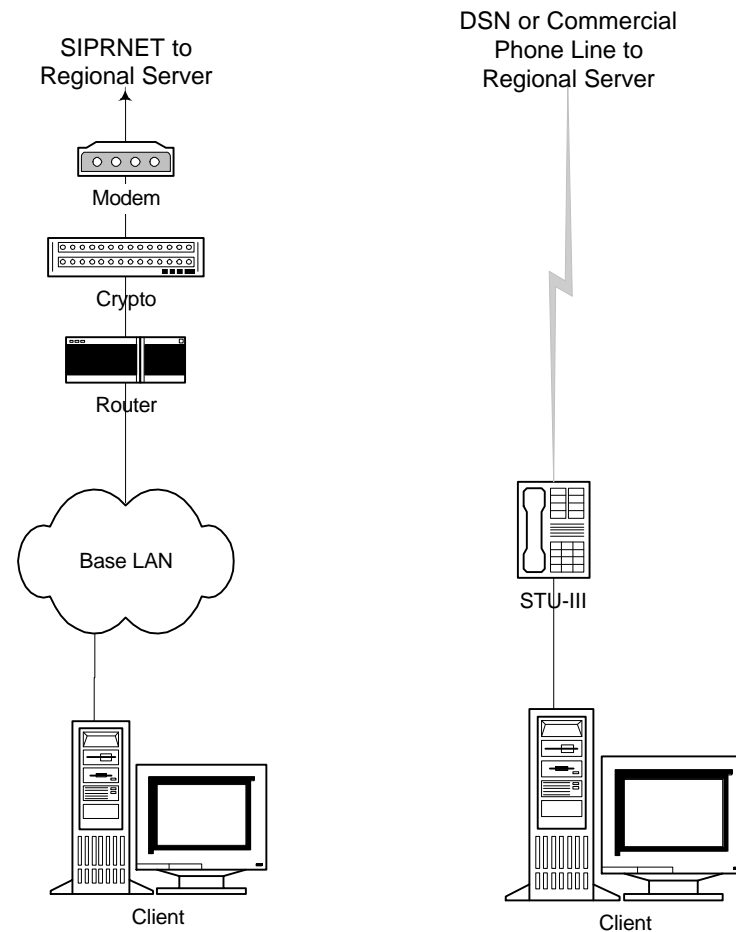
Joint Spectrum Center

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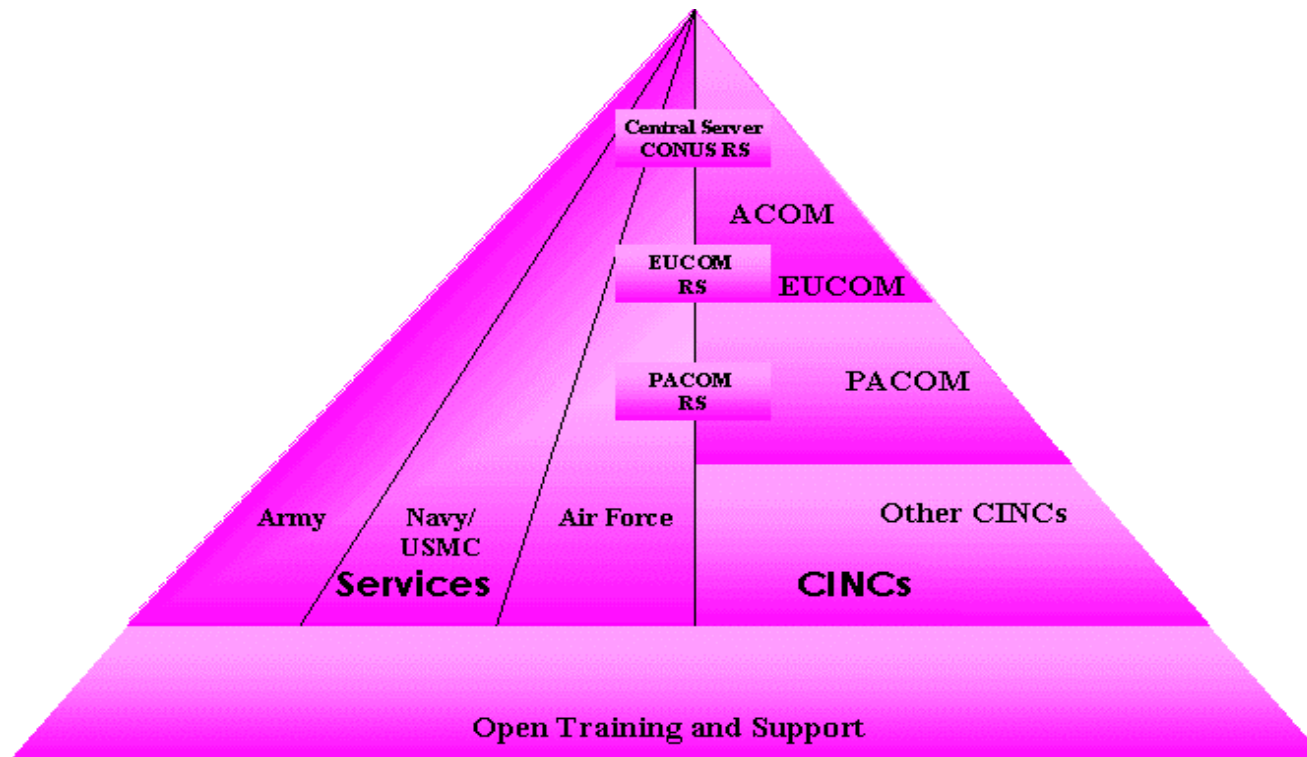
Client Site Configurations



WAN Connection Options



Transition Strategy Overview



SPECTRUM XXI Platform Configurations

	Regional Server	Client - Single-Disk Configuration
CPU	Dual Pentium II	Pentium II
RAM	128 Mbytes	64 Mbytes
Disk Drives	12 - 4 Gbytes	See Table 4-1 ¹
Cache Memory	TBD	512 k Bytes
Controller	SCSI (Adaptec 2940)	Ultra ATA
Monitor	21" 1280x1024 pixels	17" 1280x1024 pixels ²
Graphics Accelerator	Yes	Yes
Video Memory	2 Mbytes	2 Mbytes
CD-ROM	12x or faster	12x or faster
PCMCIA Type II Card Slots ³	2 each	2 each
Printer	600x600 dpi NT supported	600x600 dpi NT supported
Tape Backup	4 mm, SCSI	4 mm
Floppy Disk	3.5"	3.5"
Mouse, Keyboard	Yes	Yes
UPS	Yes	650 VA ⁴
Operating System	NT 4.0 (Server)	NT 4.0 (Workstation)



1 Hard disk drives should be removable.

2 SPECTRUM XXI may also be hosted on a Laptop computer supporting a 1024x768-pixel display.

3 PCMCIA Type II card slots are for use with Fortezza cards.

4 American Power Conversion (APC) model Back-ups Pro 650 VA or equivalent.

SPECTRUM XXI Commercial Software

Table 4-3. SPECTRUM XXI COTS Software

	Regional Server	Client
Database	Oracle* 8 Server for NT	DBMS included with SPECTRUM XXI software
e-mail	Not Applicable	UFS ¹
Web Browser	Not Applicable	UFS (Netscape ²)
Telecommunications	TBD	UFS
Tape Backup	TBD	UFS ³
Office Automation	Not Applicable	UFS (MS Office ²)
Virus Protection	TBD	UFS
GCCS	Not Applicable	UFS ⁴

UFS - User Furnished Software

* The number of licenses purchased establishes the maximum number of simultaneous users.

¹ Defense Messaging System (DMS) compliant, such as MS Exchange

² Defense Information Infrastructure (DII) Compliant NT software

³ NT Compliant 4mm tape backup software

⁴ GCCS NT Segments determined by user requirements and acquired from DISA

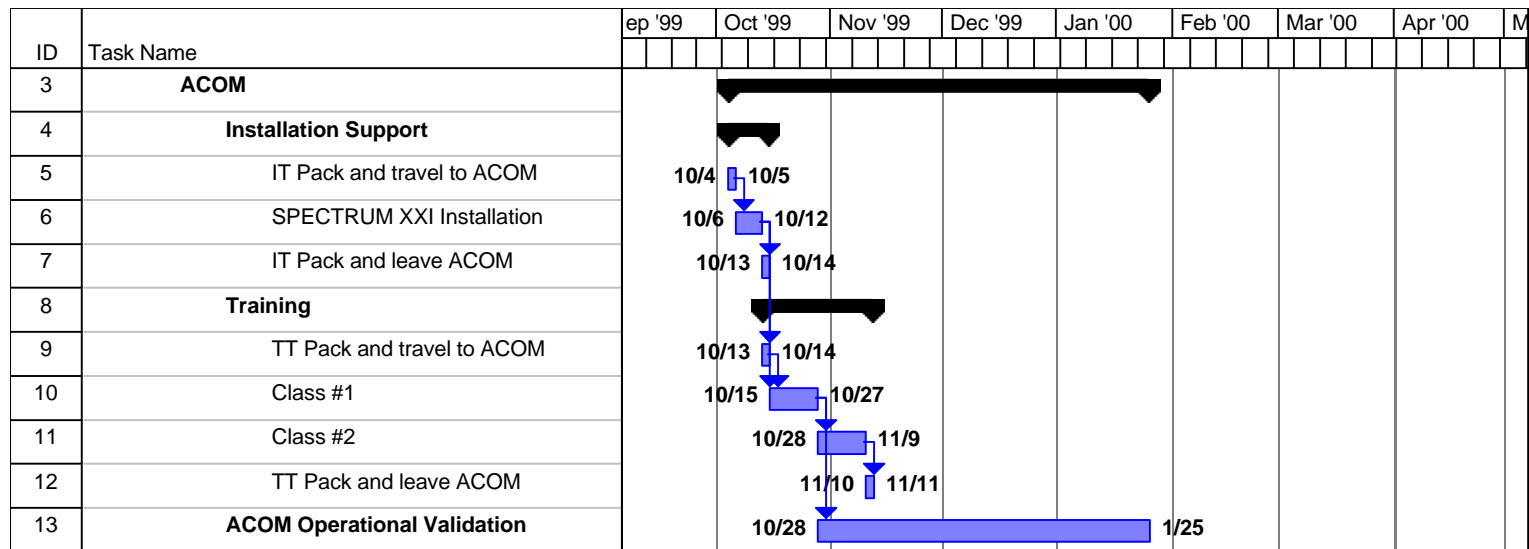


CINC Fielding Schedule

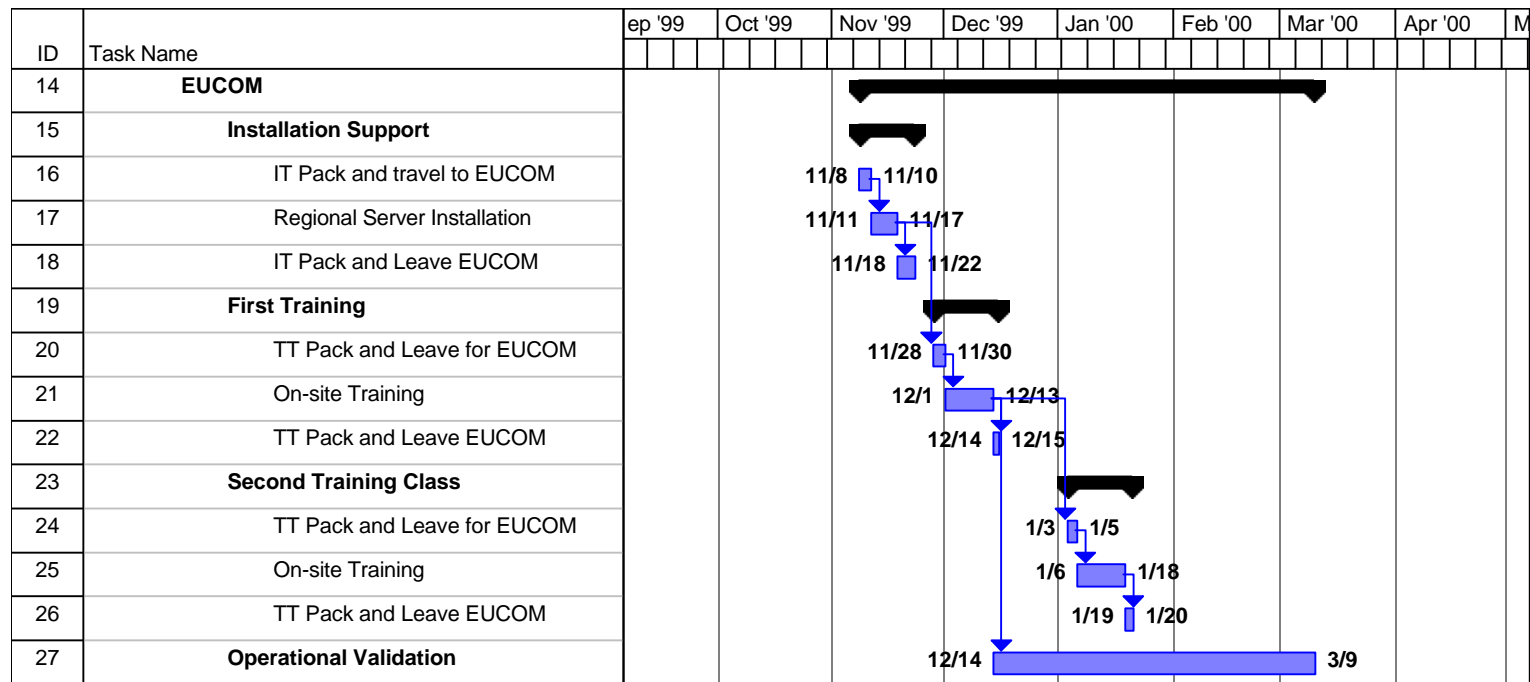
ID	Task Name	ep '99	Oct '99	Nov '99	Dec '99	Jan '00	Feb '00	Mar '00	Apr '00	M
2	CINC Fielding									
3	ACOM									
14	EUCOM									
28	PACOM									
42	CENT, SOU, SOC, Space									



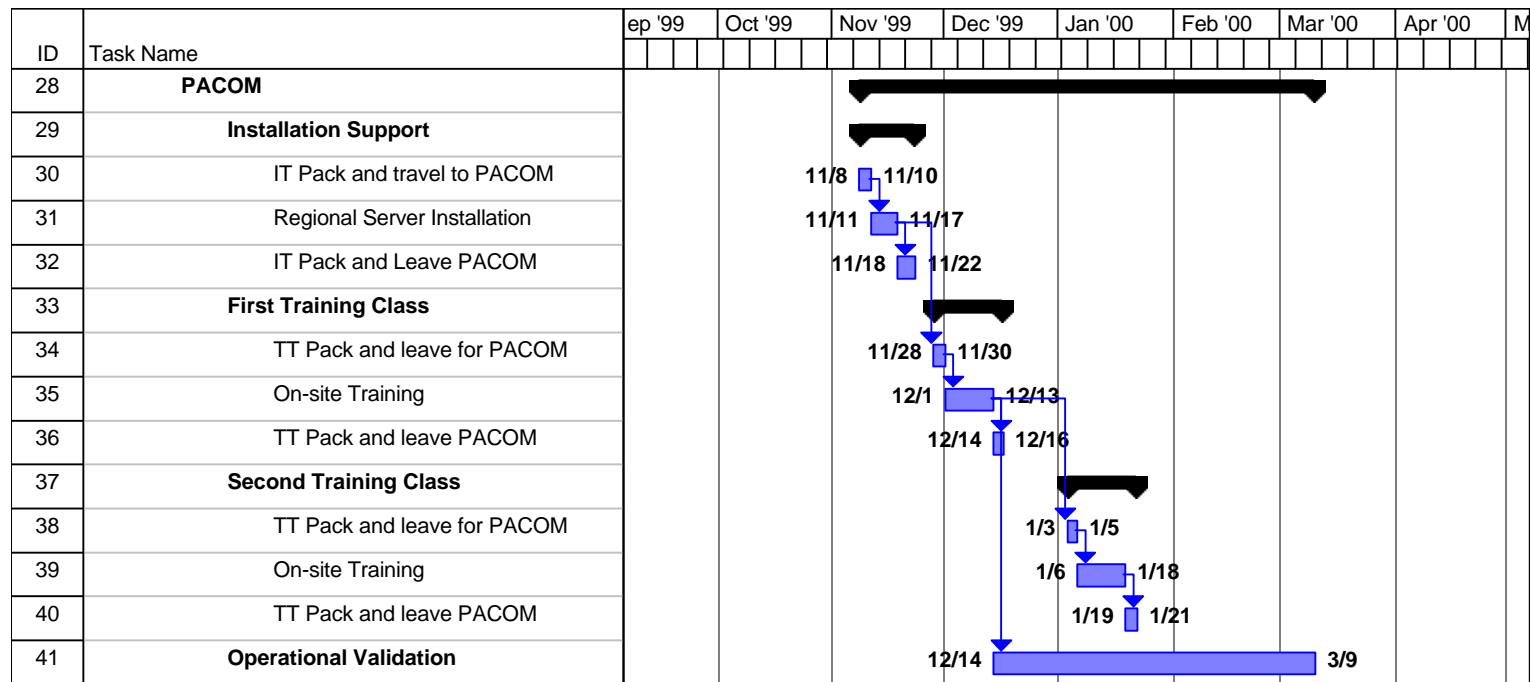
ACOM Fielding Schedule



EUCOM Fielding Schedule



PACOM Fielding Schedule



CONUS CINCs Fielding Schedule

ID	Task Name	ep '99	Oct '99	Nov '99	Dec '99	Jan '00	Feb '00	Mar '00	Apr '00	M
42	CENT, SOU, SOC, Space									
43	First Training Class									
44	TT Pack and travel to Regional Site									
45	On-Site Training									
46	TT Pack and leave Regional Site									
47	Second Training Class									
48	TT Pack and travel to Regional Site									
49	On-Site Training									
50	TT Pack and leave Regional Site									

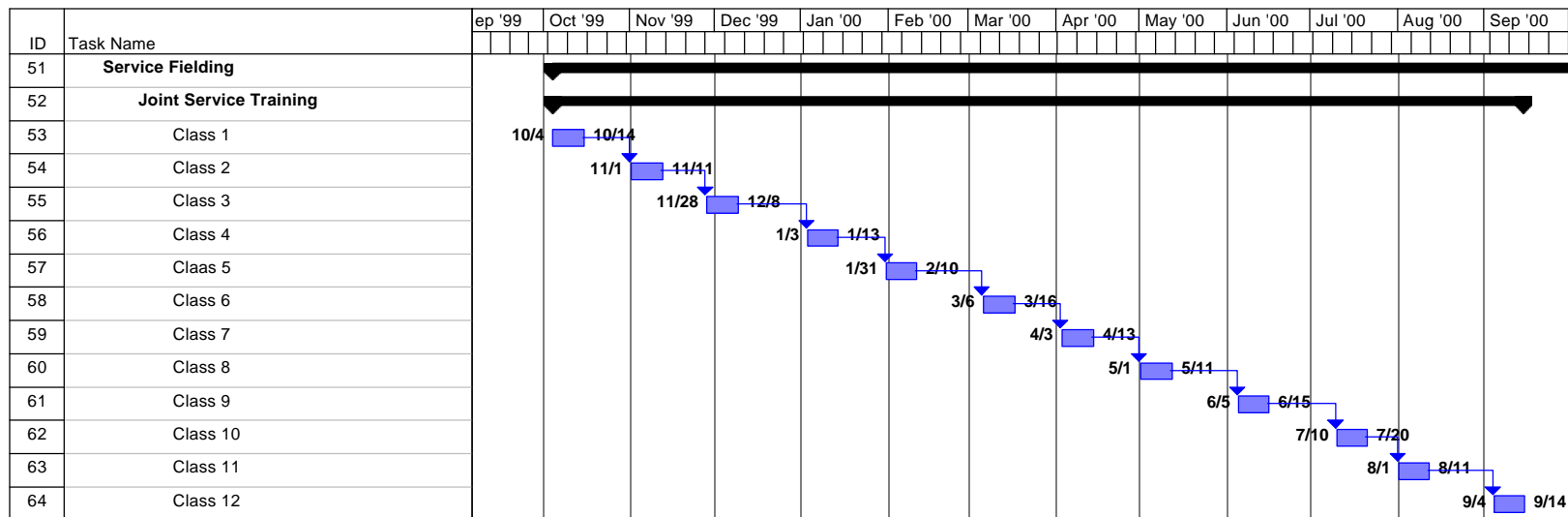


Service Fielding Schedule

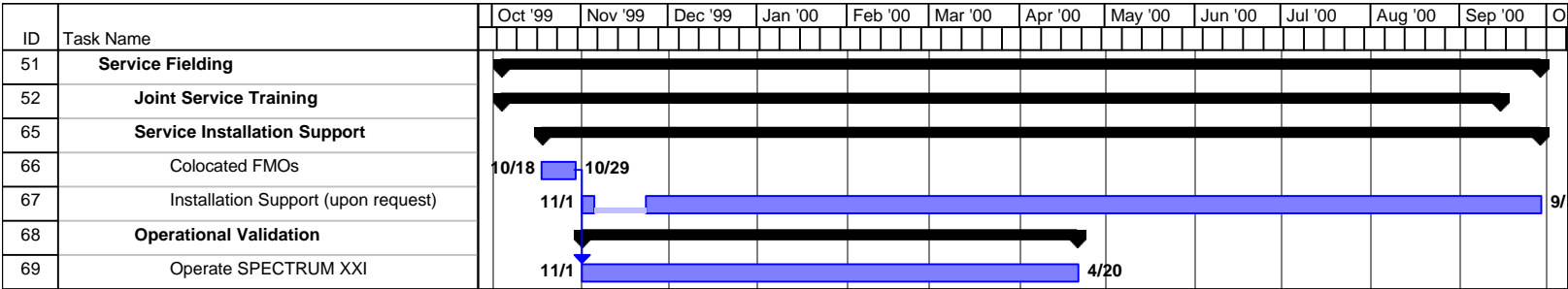
ID	Task Name													O
		Oct '99	Nov '99	Dec '99	Jan '00	Feb '00	Mar '00	Apr '00	May '00	Jun '00	Jul '00	Aug '00	Sep '00	
51	Service Fielding													
52	Joint Service Training													
65	Service Installation Support													
68	Operational Validation													



Joint Service Classes at the JSC

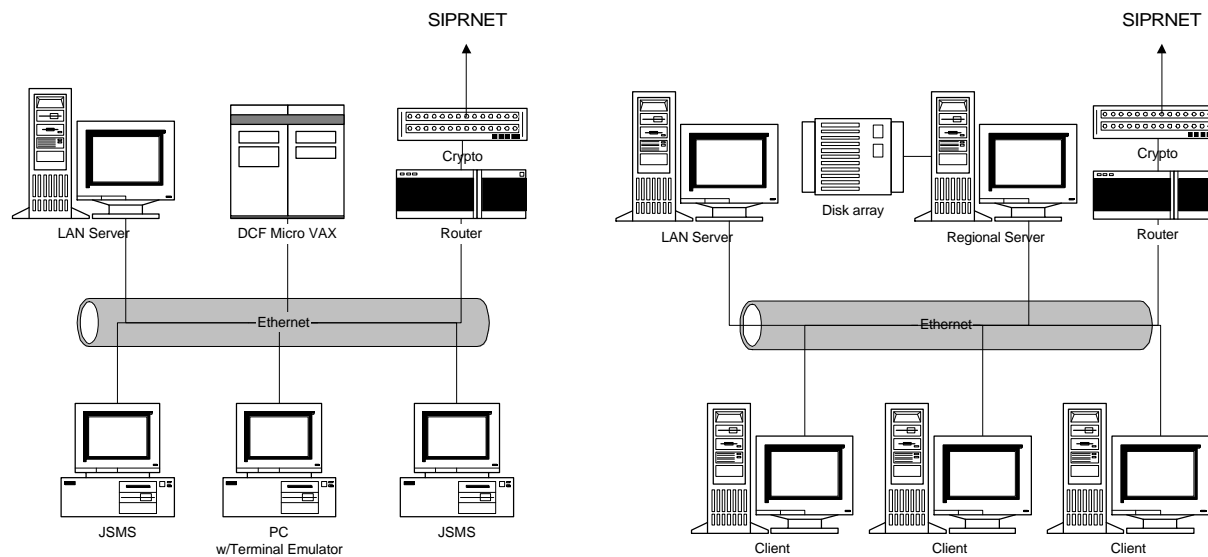


Service Installation Support



Regional Server Site

TRANSITION OF A NOMINAL
DCF SITE W/LAN TO A
REGIONAL SERVER SITE

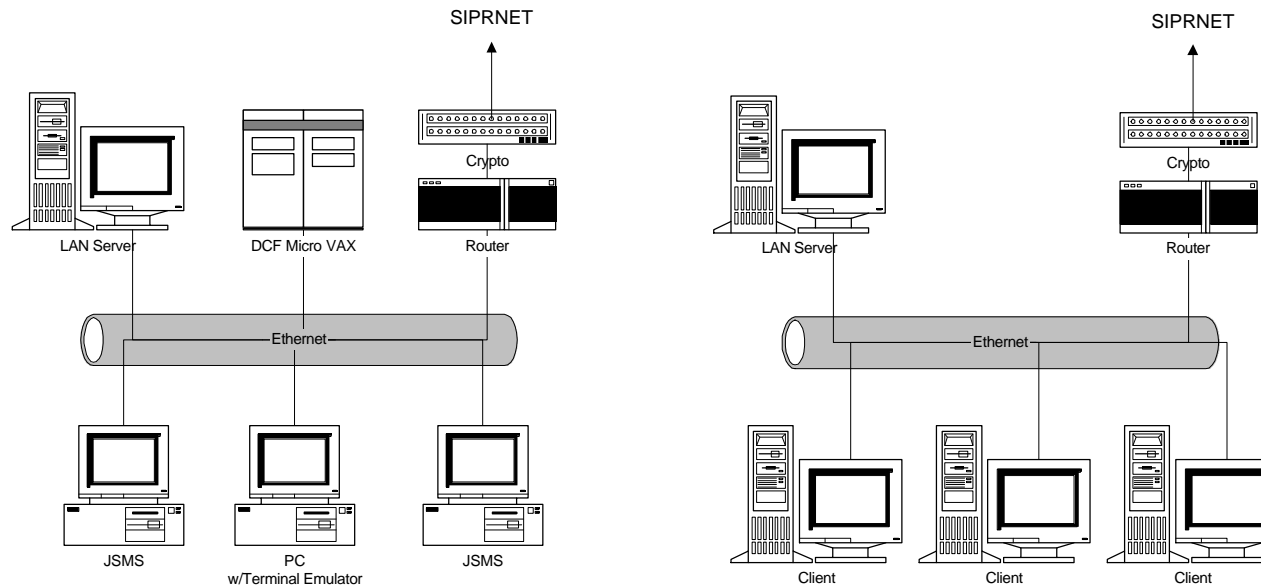


Transition Steps

1. Install Regional Server.
2. Add SPECTRUM XXI Clients, incrementally.
3. Deinstall DCF.

DCF Site to Client Site (with LAN Server)

TRANSITION OF A NOMINAL DCF SITE CONFIGURATION w/LAN

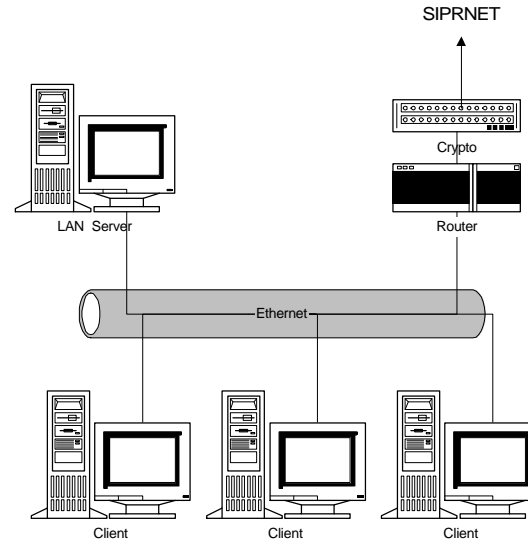
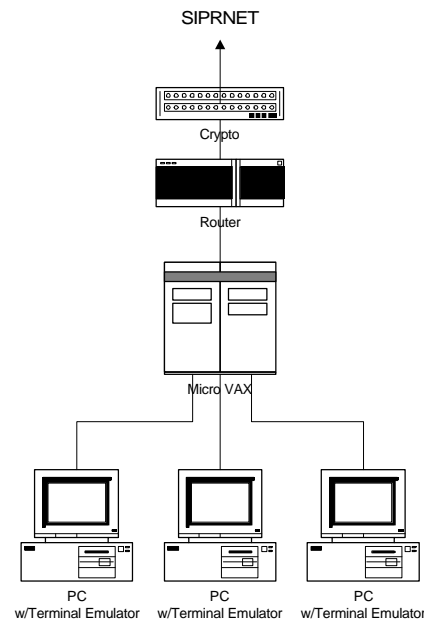


Transition Steps

1. Upgrade LAN Server if required.
2. Add SPECTRUM XXI Clients, incrementally.
3. Deinstall DCF.

DCF Site to Client Site (with LAN Server)

TRANSITION OF A NOMINAL
DCF SITE CONFIGURATION
w/o LAN



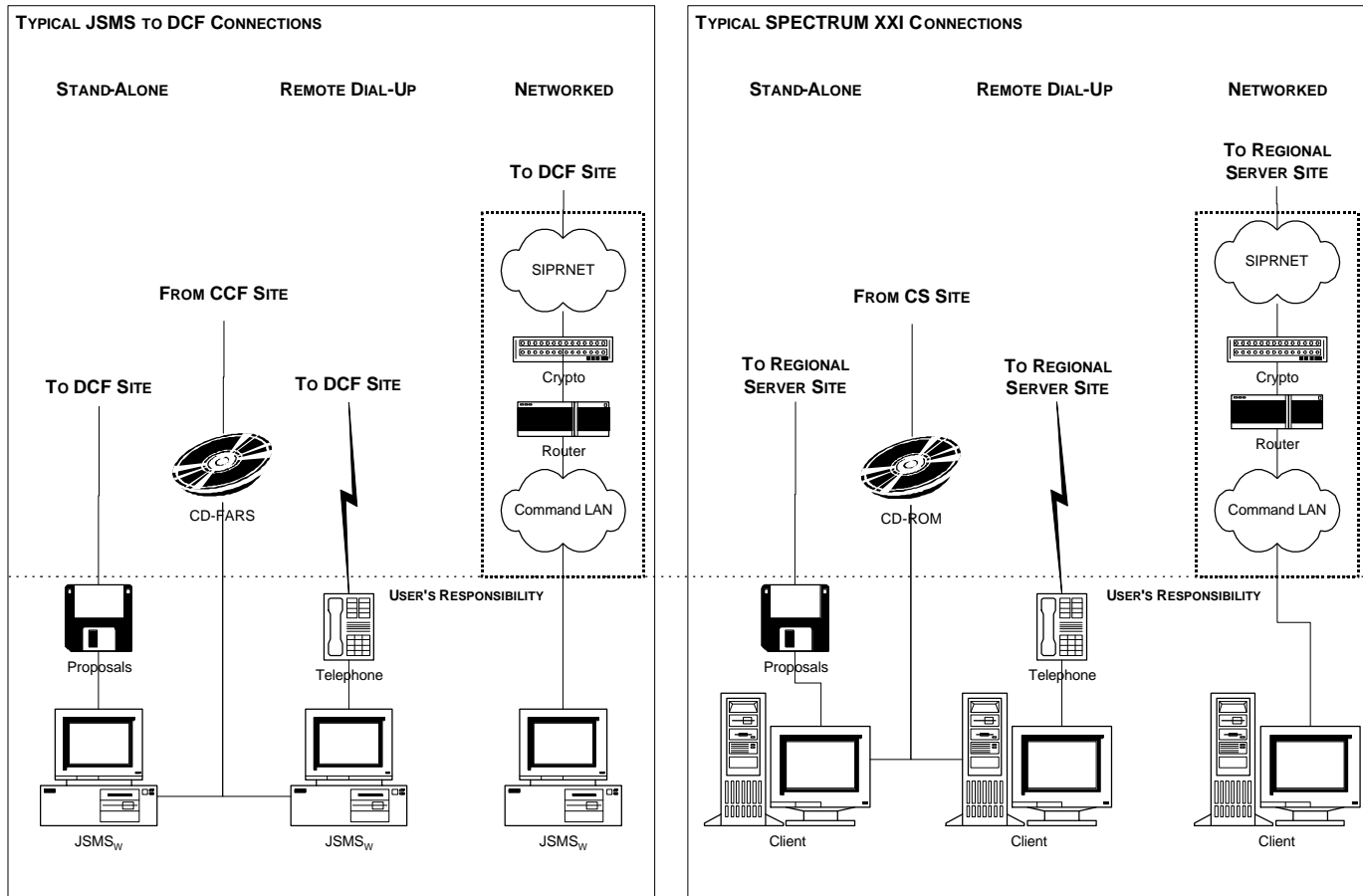
Transition Steps

1. Acquire & Install LAN Server.
2. Add SPECTRUM XXI Clients, incrementally.
3. Deinstall DCF.



Unclassified

JSMS Site to Client Site (Client Site Without LAN Server)



Joint Spectrum Center

Unclassified

Appendix B
SPECTRUM XXI Transition Checklist

SPECTRUM XXI Site Transition Checklist

Ref. Para.	Transition Step	Scheduled Date	Status
5.1	Plan Site Transition		
5.1.1	Determine Site Configuration		
	Determine LAN Server Requirement		
	Select Wide-Area Network Connection Type		
	Select Client Disk Configuration		
5.1.2	Determine Site Support Requirements		
	Base Support		
	Staffing		
	Training		
5.1.3	Develop Site Transition Plan		
5.1.3.1	Document Hardware/Software Requirements		
	SPECTRUM XXI Client Requirements		
	FMO Infrastructure Requirements		
5.1.3.2	Determine Incremental Cross-Over Strategy		
5.1.3.3	Determine Training Requirements		
	SPECTRUM XXI Training		
	Identify 3rd Party Training Requirements		
5.1.3.4	Establish Milestones and Schedule		
5.1.3.5	Identify Points-of-Contact		
	JSC (Planning, Training)		
	DISA (SIPRNET Access)		
	Base Security Officer (Classified Processing, Accreditation)		
	Purchasing		
	Facilities		
	Base Information Systems Management		
	3rd Party Training		
5.1.3.6	Determine Legacy System Disposition		
5.1.4	Program Resources		
	Identify Resource Requirements		
	Compare Requirements to Programmed Resources		
	Mitigate Short-falls		
5.2	Acquire Hardware/Software/Network Access		
5.2.1	Acquire Hardware/COTS Software		
	Extract Platform Specifications		
	Prepare Purchase Request		
5.2.2	Secure Area		
	Determine Changes in Existing Operations		
	Coordinate Requirements with Base Security Officer		
	Determine Required Facility and Procedural Upgrades		
	Request Required Facility Upgrades		
	Prepare Accreditation/Reaccreditation Documents		
	Arrange Accreditation Site Inspection		
5.2.3	Coordinate SIPRNET Requirements with Base Network Manager		
	Coordinate SIPRNET Requirement with DISA		
	Coordinate STU-III Requirement		
5.2.4	Schedule SPECTRUM XXI Training		
	Coordinate JSC or On-Site Courses		

SPECTRUM XXI Site Transition Checklist

	Determine Training Requirements/Class Type		
	Schedule Class Attendance		
5.3	Obtain 3rd Party Training	_____	_____
	Obtain 3rd Party Training in Hardware and NT Networks		
5.4	Implement Client Site	_____	_____
5.4.1	Install Hardware/COTS Software	_____	_____
	Install FMO Infrastructure Upgrades		
	Install SPECTRUM XXI Client Platforms		
	Set-up Hardware		
	Load COTS		
	Connect to FMO LAN		
5.4.2	Determine Site Readiness	_____	_____
	Run Hardware, Software, LAN Diagnostics		
	Determine SIPRNET Availability		
5.5	Obtain SPECTRUM XXI Training	_____	_____
5.6	Install SPECTRUM XXI	_____	_____
5.6.1	Install SPECTRUM XXI Software	_____	_____
	Install SPECTRUM XXI Client Applications	_____	_____
5.6.2	Map Databases	_____	_____
	Map Temporary Assignments		
	Map CEOI Data		
	Map JRFL Data		
	Map Certification Data		
5.6.3	Establish Client Account and Data Profiles	_____	_____
5.6.4	Install Background Assignment Data	_____	_____
5.7	Operate SPECTRUM XXI	_____	_____
	Begin Initial Operations		
	Begin Full Operations		
5.8	Decommission Equipment		
	Decommission DCF	_____	_____
	Decommission JSMS		

Appendix C
SPECTRUM XXI Training Module Checklist

SPECTRUM XXI Training Module Checklist

BLOCK 1 (ALL STUDENTS)		36 Hrs 30 min	<input checked="" type="checkbox"/>
1. Introduction		15 min	
2. Spectrum XXI Development Background		45 min	
3. "Managing the Spectrum Using Spectrum XXI" Briefing		1 Hr	
4. Getting Started		4 Hrs	
5. Loading Equipment Data		30 min	
6. Managing SCS Data		1 hr	
7. Managing Topographic Data Using the Topographic Manager (TOPOMAN)		30 min	
8. Managing Frequency Assignments		19 Hrs 30 min	
A. Purpose of Frequency Assignment		10 min	
B. Importing Initial Frequency Records into Spectrum XXI		2 Hrs 20 min	
C. Creating and Restoring Database Archives		30 min	
D. Querying Spectrum XXI for Frequency Records		1 Hr 30 min	
E. Outputting Frequency Records from Query Results		1 Hr	
F. Changing Status of Selected Frequency Records		1 Hr 30 min	
G. Creating a Site License from Selected Frequency Records		10 min	
H. Plotting Selected Frequency Records		50 min	
I. Spawning Selected Frequency Records to a File		30 min	
J. Deleting Selected Frequency Records		5 min	
K. Mass-Changing Selected Frequency Records		45 min	
L. Copying a Selected Frequency Records to the Editor		10 min	
M. Editing a New Frequency Proposals in the Editor		4 Hrs	
N. Nominating Frequencies from the Editor		1 Hr 30 min	
O. Displaying Results of Last Import		5 min	
P. Packing Databases		5 min	
Q. Performing Data Exchange and Electronic Coordination		50 min	
R. Creating Frequency Records Management Reports		2 Hrs	
S. Practical Exercises		1 Hr 30 min	
9. Running Standalone Compliance		1 Hr	
10. Using Spectrum XXI System Manager		1 Hr	
11. Block 1 Practical Exercises		7 Hrs	
BLOCK 2 (MORE FUNCTIONS)		10 Hrs	
12. Managing Allotment Plans		3 Hrs	
13. Performing Interference Analysis		1 Hr	
14. Managing Interference Reports		30 min	
15. Using Spectrum XXI Engineering Tools		3 Hrs	
16. Block 2 Practical Exercises		2 Hrs 30 min	
BLOCK 3 (TACTICAL STUDENTS)		9 Hrs	
17. Managing Joint Restricted Frequency Lists (JRFLs)		2 Hrs	
18. Performing Electronic Warfare Deconfliction		30 min	
19. Block 3 Practical Exercises		6 Hrs 30 min	

Organization:

Training Dates:

Participants:

[illegible]